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JULY 1, 1928

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New Developments with Dispersed Rubber

H. A. WINKELMANN

CHIEF CHEMIST, THE PHILADELPHIA RUBBER WORKS CO.

THE development of aqueous dispersions of rubber is a major contribution to the progress of rubber technology. Announcement that Dispersions Process, Inc., Oaks, Pa., has acquired control of the patents on aqueous dispersions, including those of crude and reclaimed rubber is of particular interest since it signifies that the process has been proven commercially. These patents are based on the original researches of W. B. Pratt,[1] L. Kirschbraun,[2] and H. L. Trumbull and J. B. Dickson.[3] The scope and application of rubber and reclaim dispersions has been greatly increased by research and development work in the laboratories of Research, Inc., and some of the large rubber companies. The results which are being obtained with aqueous dispersions fully justify predictions which were made as to their ultimate value. The broad scope of the application of aqueous dispersions of rubber to the rubber industry alone will place this development on a parity with other contributions of recent years, such as accelerators of vulcanization, carbon black for rubber, Hopkinson L-S. rubber, anti-oxidants, anode rubber, thermoprene, etc. Whereas most of these advances apply mainly within the rubber industry, it will be of interest to know that aqueous dispersions of rubber find applications in many other and constantly increasing fields. Rubber, by virtue of those properties which it imparts when applied as an aqueous dispersion, is now being used as a component of products in which it had never heretofore been used.

Several articles have appeared in INDIA RUBBER WORLD,[4] reporting in a preliminary manner, progress on the experimental work relative to aqueous dispersions. Numerous applications for aqueous dispersions were suggested in these articles. It is the purpose of this paper to discuss those applications which have been proven to be commercial. The application of aqueous dispersions is discussed with reference to industries which are employing them at the present time.

Present methods for preparing aqueous dispersions are simple and economical to carry out and give a product of such superior quality that the advantages over previously suggested methods are quite obvious. Aqueous dispersions of crude or reclaimed rubber are effected by a kneading, pulling and mixing action in a suitable mixer in the presence and through the agency of water and a hydrophilic colloid. Hydrophilic colloids having a peptizing action are used to assist in reducing the interfacial tension between the rubber particles, until the particles through the swelling by the water plus the action of the colloid, no longer adhere to each other, but become dispersed in water which is the continuous phase. Peptizing agents make it possible to prepare a rubber dispersion with the minimum amount of mechanical energy. After production of the dispersion it may, if necessary, be stabilized by addition of a small amount of protective colloid. The dispersing agent is usually added to the rubber in the mixer followed by the addition of water to the desired dilution. The dispersing agent used depends upon the crude or reclaimed rubber or rubber compound to be dispersed, as well as the use for which the dispersion is intended. When properly chosen, dispersing agents will not retard the cure of the compound. Some of the available dispersing agents are fatty acids, resin acids, salts of fatty acids, soaps, glues, saponins, Irish moss, albumens, caseins, colloidal clays and admixtures of these materials.

Manufacturers using solvent cements of rubber or rubber compounds readily

WATER dispersions have a wide application in various industries and are being used more and more as the result of progressive development.

The author of this article hopes that it will suggest to the reader the use of dispersions as a solution of his own problems.

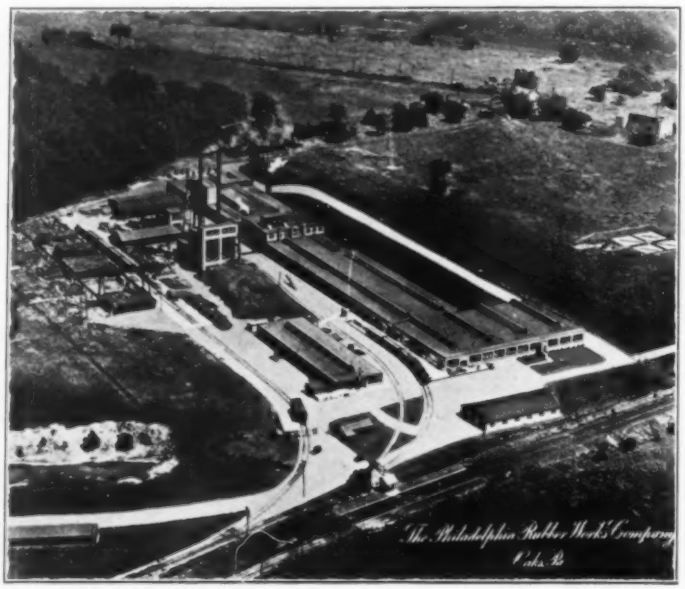
[1] Italy Patent No. 225,949 (1923).
[2] U. S. Patent No. 1,498,387 (1924).
[3] U. S. Patent No. 1,513,139 (1924).
[4] I. B. Tuttle, I. R. W., vol. 67, p. 213 (1923).
I. B. Tuttle, I. R. W., vol. 67, p. 291 (1923).
I. B. Tuttle, I. R. W., vol. 68, p. 488 (1923).
I. B. Tuttle, I. R. W., vol. 69, p. 219 (1924).
Anonymous, I. R. W., vol. 69, p. 361 (1924).
Anonymous, I. R. W., vol. 70, p. 785 (1924).

recognize the advantages which may be obtained by the use of aqueous dispersions. The elimination of solvent losses, fire and health hazards and high insurance costs results in very material savings. The improvement in physical and aging properties of the rubber or rubber compounds is marked. Aqueous dispersions can be prepared in a shorter time than cements and provide greater flexibility of concentration. In some cases, the equipment used for applying solvent cements requires minor changes for use with aqueous dispersions in order to speed up the drying operation. A spreader, for example, may require a longer steam table or more steam coils; it may also be covered and a current of air passed over the spread fabric.

Attempts to use rubber latex date back to the beginning of the rubber industry itself. Its industrial applications have, however, been limited by a number of factors. The development of aqueous dispersions of crude rubber or rubber compounds due to greater flexibility, has eliminated many of the problems which were encountered with rubber latex. Broadly speaking, aqueous dispersions containing reclaimed rubber or crude rubber can replace rubber latex because of their relatively low cost, better friction pull and improved aging properties.

Cost, Stability and Uniformity

Aqueous dispersions of crude rubber eliminate handling and transportation charges on latex and can therefore be furnished at a lower cost. Obviously, aqueous dispersions of reclaimed rubber furnish further cost advantages.



Air View of Philadelphia Rubber Works Co., Oaks, Pa., Where Dispersions Process Co. Is Also Located.

Aqueous dispersions are exceedingly stable. They are prepared in the factory in which they are used, in quantity as required, which eliminates the transportation difficulties encountered in the preservation and shipment of rubber latex.

Aqueous dispersions of rubber or rubber compounds may be made from rubber which has been standardized as to rate of cure, plasticity, color and tackiness. By preparing the dispersions under controlled conditions, uniformity in consistency, concentration and quality may be easily secured. The variations existing in crude rubber from lot to lot only serve to emphasize the uncertainty of being able to obtain latex of uniform quality. Unless carefully treated, films prepared from rubber latex are dry and possess but little surface tack, and this feature makes it difficult to handle them in laminated constructions. By using crude rubber dispersions, the surface tack may be controlled at will.

Compounding Ingredients

The preparation of aqueous dispersions of crude rubber containing compounding ingredients, vulcanizing agents and anti-oxidants, is a relatively easy operation. Materials are added to the rubber on a mixing mill or an internal mixer prior to dispersing. The rubber and protective colloid used for dispersion keep the compounding ingredients in colloidal suspension. The compounding ingredients may also be incorporated in the mixer after the dispersion. When appreciable amounts of pigments are added to latex, the pigments must be treated with protective colloids in water prior to their introduction to prevent coagulation.

Reclaimed Rubber

Reclaimed rubber can be dispersed more rapidly and with less added protective colloid than crude rubber. It is, therefore, possible to effect the same material savings by the use of reclaims in the field of dispersions as is the case in regular compounding practice. It is also possible to make greater substitution of reclaimed rubber for crude rubber in dispersion compounds than in ordinary compounding practice because of improved quality. In doubling cements for raincoats, etc., friction pull tests show that a rubber compound containing no crude rubber gave better results than when rubber latex or a solvent cement of crude rubber was used. The coatings obtained with dispersed reclaim cure more rapidly and show improved aging. The low cost, stability, absolute cleanliness and general properties of dispersions containing reclaimed rubber insure an increasing field for the application of such dispersions.

The Textile Industry

Many applications for dispersed rubber have been found in the textile industry. Dispersions in many instances are already being used commercially, while in other cases the work is still in a more or less experimental stage. In the manufacture of automobile top material, dispersed rubber compounds may be used in place of solvent cements, resulting in improved adhesion and aging properties. A saving in cost has been effected in the manufacture of these materials, with elimination of solvents. Fire and health hazards and necessity for expensive solvent recovery systems are eliminated. Another application for dispersed reclaim and compounds is in the backing for rugs, carpets, mats, upholstery, etc. A dispersion of desired concentration is used, and the articles made in this manner maintain their shape and have superior aging properties. In the manufacture of waterproof garments such as raincoats, etc., dispersions are now being used effectively in doubling cements. Tarpaulin material can be easily and cheaply coated with dispersed rubber compounds.

Cloth bags and sacks such as are used in shipping materials which must be kept dry are effectively proofed with dispersed rubber. This treatment also strengthens the fabric and makes it more resistant to rough handling during shipment. In the case of elastic webbing, it has been found that by treatment with dispersed rubber, the formation of runs caused by the severing of the elastic thread may be prevented.

The Paper Industry

Paper impregnated with aqueous dispersions of crude rubber, reclaim or compounds has many special applications. Increased tensile strength, resistance to tear, flexibility, folding number and valuable water resisting properties result from the impregnation treatment.

Aqueous dispersions may be used to impregnate pulp in the beater prior to paper manufacture. The resulting products have better resistance to tear and folding and have special properties that make them very desirable for many purposes.

Waterproofing or damp-proofing of paper bags for use as containers of merchandise liable to damage through absorption of moisture is an application for dispersions, usually of the reclaim or compounded type.

Dispersions of reclaim and compounds are useful in the manufacture of wall board and similar protective products for use in construction of buildings.

An interesting application of latex or dispersed rubber in the canning industry is its use for sealing the seams of tin or like containers.[5]

Aqueous dispersions of crude and reclaimed rubber provide greater flexibility for the anode process. The advantages obtained by using aqueous dispersions, which have already been discussed, are particularly applicable here.

Various special type dispersions are being investigated in rubber-gum plastics for use in paints, tree surgery, etc.

Considerable experimental work is being carried on at present to utilize aqueous dispersions of crude rubber, reclaimed rubber and rubber compounds in impregnating and coating of fabrics of all kinds for use in the rubber industry. Fabrics for tires, boots and shoes, hose, belting, packing, flaps, blowout patches, valve pads, etc., offer a large field for aqueous dispersions. The use of dispersions in many cases has eliminated the staining of fabrics which is often encountered with solvent cements.

Dispersions of rubber compounds may be applied to fabrics using lighter equipment, such as a spreading machine, in place of a calender. Warm up mills are eliminated. The dispersions can be applied with lower power costs. The concentration of rubber compounds in the dispersion may be varied as desired although a maximum concentration greatly reduces the drying operation. Scorching problems experienced with present calender methods would not be encountered, resulting in increased use of low temperature accelerators. Low temperature curing is beneficial to both fabric and rubber and improved results are reflected in the finished product. A better bond is secured between fabric and rubber due to improved impregnation and insulation of the cords. A long series of tests indicates that higher friction pulls are obtained.

Rubber dispersions are being used on a steadily increasing scale. It has been shown that dispersions have a wide range of application in various industries. New uses are being and will be developed as the result of investigations now in progress. A great deal of work remains to be done to develop on a commercial basis a large number of suggested uses of rubber dispersions. This article, it is hoped, will suggest to the reader the use of dispersions as a possible solution of some of his own problems.

[5] B. Dewey and E. Hopkinson, English Patent No. 196,881 (1923).

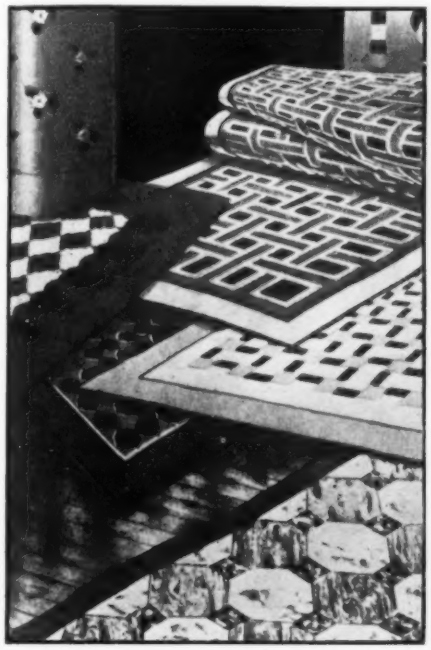
A Pneumatic-Solid Tire

A tire within a tire is the recent device of a Pacific Coast inventor, and a model tried on a fire engine in a large city for five months is said to have proved very serviceable. The combination tire consists of a casing resembling the familiar type externally but into which is inserted a somewhat flattened inner tube having fastened to its inner circumference a modified solid tire that may be attached to an ordinary pneumatic tire rim. It is claimed that such a combination tire will greatly reduce the danger to automobile drivers whose tires may be punctured while running at high speed. If the outer casing bursts or the tube flattens suddenly, the inner or solid tire may still afford a large margin of safety.

Rubber Carpets

Adaptable for All Modern Decorative Schemes

A unique and interesting display of rubber carpeting and flooring was shown by The Standard Insulator Co., Ltd., at the spring exposition of the Builders' Exhibition held at Olympia, London. The goods were manufactured by Electro-



Cable Co., Paris, France. They fill adequately the essential requirements of a perfect floor covering, namely, adaptability for all modern decorative schemes; satisfaction on all points of economy; the maximum in comfort and perfect hygienic conditions. They are thus found in every conceivable place on ship and shore where such flooring is called for.

A special feature of the goods exhibited is found in the fact that they can be supplied in large areas up to about 45 feet long by 15 feet wide, made in inlaid patterns of any design to meet the purchaser's requirements and in any color scheme without visible sign of joints. An added feature is that rubber carpets with borders can be made to cover any area in rooms of regular construction and laid without requiring to be stuck with cement or paste.

The half dozen typical designs indicated in the illustration represent a random selection of the unlimited possibilities of color and treatment in rubber flooring.

The brilliant color effects and attractive texture of the surface of these carpets are enhanced by power sanding which also develops a pleasing texture of the surface.

Rubber Veneer Board

A ply-board which is claimed to be much stronger and more durable and pliable than most other veneered products and especially suitable for light boats and airplane fuselages is of a triplex type. The core is of hard vulcanized rubber and cemented to either side under pressure are layers of tough, flexible wood. The inventor is Arlie W. Schorger, Madison, Wis.; and the manufacturer, C. F. Burgess Laboratories, Inc., Dover, Del. U. S. Patent No. 1,649,983, Nov. 15, 1927.

Rubber Institute is

General Lincoln C. Andrews

The Rubber Institute Has Been Organized by Representative Rubber Manufacturing Companies for the Following Purposes:

To promote in the industry a mutual confidence and a high standard of business ethics.

To eliminate trade abuses.

To promote sound economic business customs and practices.

To foster wholesome competition.

To provide ultimately for individual efficient business management operating independently an opportunity to do business with an adequate return.

And thus generally to promote the service of the industry to the public welfare.

A GROUP of American rubber manufacturers recognizing the necessity of remedying merchandizing conditions in the industry invited all of the rubber manufacturers in the United States to convene at the Plaza Hotel, New York, N. Y., on June 1, and discuss the advantages of an institute to the industry and its relations to government. Representatives of over forty rubber manufacturing companies attended and approved the organization declaration of The Rubber Institute, Inc.

The need for such an institute, its relation to government and the benefit to be derived from it by large and small manufacturers alike was convincingly stated by Director-General, Lincoln C. Andrews.

Address of General Andrews

Recently a group of rubber manufacturers felt that something must be done promptly to remedy merchandising conditions. They asked me to meet them and discuss the advantages of an institute to the industry and its relations to government. This ended in their determination to organize an institute at once, with me as its leader. We drew up a certificate of incorporation and by-laws, adopted them tentative upon their acceptance in Washington, and arranged this meeting in the hope that all manufacturers would join in this undertaking. Those of you who were not present have therefore two things to consider—the Institute itself, and the important question of my personality as its leader. We can dispose of the latter promptly.

After thirty years as a regular army officer, I retired voluntarily at the close of the war to leave the calm of army life for whatever adventure I might find in the business world. As a business man I have been more interested in underlying principles and policies than in trying to perfect myself in any particular technique. In both fields, I have found honesty to be the best policy, and am convinced that the bigger the man the more his intercourse with his fellows is characterized by frankness, integrity, consideration for others and a practice of the square deal. That is my personal code. In addition, I want to express my deep appreciation of the responsibilities of my present undertaking, my knowledge that it will require the constant application of my highest endeavors and abilities, and my sincere belief that it is an outstanding opportunity for constructive work of a high order and of real benefit to my country.

Need for the Institute

Now for the Institute. This is so tremendous a subject that I may not hope to explain it fully. Nor in this brief time have I been able to assimilate all its phases. I shall frankly quote somewhat from the public utterances of those government officials who are specialists and outstanding leaders in this new industrial movement.

Thirty years ago the government outlawed trusts and monopolies in restraint of trade as repugnant to the fundamental philosophy of life on which our civilization is founded. During those thirty years, economic conditions developed quite beyond the power of human imagination to have conceived at the time. In the presence of modern mass production and distribution, competition between groups and even between industries, hand-to-mouth buying, and modern facilities for transportation, banking and communication, the old-time competitor standing alone and without adequate and prompt information as to his own trade data, finds himself driven to destructive competition and other desperate

Formally Organized

measures in order to keep his business going. He must seek some form of relief. This relief is in sight. The American industrialist, true to his country's principles of competition and industrial freedom, is working out successfully a new theory of business conduct summed up in the phrase, "Co-operation in Competition." The industrial institute is the machinery employed. American industry is in the midst of what amounts to an industrial evolution, gradually and often painfully developing a workable machinery, under the impulse of economic necessity and guidance of governmental agencies. The industrial institutes are on a more or less uncharted sea, but have a few beacon lights to guide them. Do you gentlemen want to take part in this evolution and seek its advantages? Many other large industries have done so, and to their greater good. It means for each of you a bigger vision and honest sincerity of purpose, a firm determination for the long pull, considerable patience in the face of discouragements and possible backslidings, and all the time a better knowledge of and a greater confidence in your fellow competitors, and the honesty and fairness of their operations. In fact, the whole foundation rests upon confidence—absolute confidence between you and me, and confidence in each other.

The one sound course to be taken is to go into the Institute with a determination to make it a practical, successful thing. There seems no other alternative to the continuance of present unsatisfactory conditions, to the "profitless prosperity" that seems to be your present lot. This warfare for the survival of the fittest gets nowhere, for it never ends, to allow the surviving fittest the enjoyment of the fruits of victory. Nor is an American going to find a suitable remedy in combinations and mergers looking toward monopoly, for he knows that sooner or later they must be governmentally regulated if not ultimately participated in. Nor will a remedy be found in price fixing or other illegal shortcuts, which invariably return to plague you.

Ignorant Competition

To bring these generalizations home to the rubber industry, let me quote a few sentences from the speech made to your Rubber Association by Colonel Donovan at your last annual meeting: "Certainly one of the most demoralizing influences in industry is ignorant competition. Its destructive effect is illustrated by your own industry. When an industry fails to make money over a period during normal times, that is an index that there is something unhealthy in that industry. . . . Knowledge of costs may be so insufficient, or in competition the factor of accurate cost may be so ignored that prices are brought down below the level of profit. It may be that, by reason of excessive producing facilities and the difficulty of finding new outlets, there are introduced marketing systems which are uneconomic and wasteful. . . .

"It is in the unhealthy industry that we find more pronounced the evils of drastic and disastrous competition. Frequently men are led into crime to save themselves from business disaster. Faced by financial ruin they may attempt to employ methods that they know to be violative of the law. . . . The fixing of prices, allotment of territory or customers, are not only inherently wrong, but inherently stupid. . . . One day, either by governmental interference or by the awakening of the industry itself, recognition will come that permanent stability and security cannot be obtained by short cuts; that no industry can recover its health until it cleanses itself of improper practices; that if it would prosper, it must base its conduct upon well thought out methods founded upon economic and scientific principles."

Rubber Institute Directors

DIRECTORS REPRESENTING COMPANIES ANNUAL SALES IN EXCESS $50,000,000

H. S. Firestone, Firestone Tire & Rubber Co.
H. T. Dunn, Fisk Rubber Co.
P. W. Litchfield, Goodyear Tire & Rubber Co.
C. B. Seger, United States Rubber Co.
J. D. Tew, The B. F. Goodrich Rubber Co.

DIRECTORS REPRESENTING COMPANIES ANNUAL SALES BETWEEN $10,000,000 AND $50,000,000

A. F. Townsend, The Manhattan Rubber Mfg. Co.
F. C. Hood, Hood Rubber Co.
W. O'Neil, General Tire & Rubber Co.
Samuel Woolner, Jr., Kelly-Springfield Tire Co.
F. A. Seiberling, Seiberling Rubber Co.

DIRECTORS REPRESENTING COMPANIES ANNUAL SALES LESS THAN $10.000,000

A. Boyd Cornell, Hamilton Rubber Mfg. Co.
E. A. Boyer, American Hard Rubber Co.
Thomas Matchett, Hewitt Gutta Percha Corp.
C. D. Garretson, Electric Hose & Rubber Co.
C. D. Dickey, Corduroy Tire Co.

Trade Associations Lawful

So much for the need of a trade institute. Now a few words as to its legality and its uses. The Assistant to the Attorney General of the United States says: "Trade Associations, as such, are not unlawful. Legislation does not forbid them. Courts have recognized that they have a proper function, if organized and operated for a legal purpose. . . .

"The true course of conduct that can be legally followed by a trade association has been laid down in certain decisions of the Supreme Court. Three of these are of particular importance. They are the Maple Flooring, the Cement, and the Trenton Potteries cases. All three opinions were written by Justice Stone, not only a scholarly judge, but a man trained in the practice as well as the theory of political economy. These opinions should serve as a certain guide to those who wish to conduct their business honestly.

"Justice Stone points out that it was not the purpose of the Sherman Law to place a penalty upon intelligence in business. That members of trade associations do not become conspirators because they gather and disseminate information with respect to production and distribution costs, and prices in actual sale of market commodities. That a manufacturer is entitled to exercise the business virtues of prudence and foresight which are based upon a knowledge of actual conditions. That restraint begins only when improper use is made of the information, and when *concerted action operates to restrain the freedom of choice of those who buy or of those who sell.*" (The italics are mine.)

As Commissioner Myers of the Federal Trade Commission said in his recent New Orleans speech, "The Supreme Court decisions in the Maple Flooring and Cement cases gave final interment to the view that 'ignorance is a virtue and knowledge a crime'; that competition means mortal combat with bowie knives in the dark; that a business man may not find out what is on the other side of the wall before he leaps."

The Commissioner makes other illuminating remarks

pertinent to the advantages of trade institute activities. In the matter of manufacturer's quoting prices, he says: "His responsibility in this particular is very great; and while he must quote a price at which he can sell his goods, he should act wisely and with due regard for the welfare of the industry as a whole. It is a mistake to suppose that the average American wants something for nothing. Deep-seated as is his objection to being gouged, he does not demand that anyone do business with him at a loss. . . . The man who undertakes to fix prices without adequate cost data may be likened to the man who drives a high-powered car into a crowded thoroughfare without previous instruction in driving. He will very likely run amuck: and while the danger to himself is great, the danger to his competitors may be even greater, and a whole industry may be imperiled and impoverished as a result of his recklessness and improvidence.

"Selling below cost for the purpose of driving a particular competitor or group of competitors out of business is a conspicuous example of unfair competition. The time may come when selling below cost, even through ignorance, will be made positively unlawful, save in the comparatively few instances, such as the reduction of surplus stocks, where the necessity for the practice is generally recognized. Such a regulation would seem, at first blush, to be extreme; but it is in keeping with the fundamental principle that one may not so use his property as to inflict unnecessary injury upon others. . . . The industry that possesses a strong trade association is equipped for self-regulation in a degree which, if wisely directed, will effectively preclude governmental interference by rendering it unnecessary. . . .

"It is highly desirable that industry proceed independently of the government in such undertakings as far as practicable. The weakness of this character of self-regulation is that the standards of conduct prescribed have no positive sanction beyond the fact that one who violates them will merit and receive the scorn of his associates. The obligation to observe standards worked out in cooperation with and approved by the government generally will be regarded as more binding, even though unenforceable as a matter of law. The Federal Trade Commission is seeking to cooperate with business in this way through the medium of trade practices conferences."

Meaning of Institute Membership

And now consider what membership in the Rubber Institute means practically. Here is the Organization Declaration of the Institute, which those wishing to join will be asked to sign. This has been written after consultation with the appropriate departments in Washington but has not been submitted to them in its final form. It is, therefore, in a measure tentative, but I believe expresses our need for an Institute, our purposes, plan and principles in a form which will come near meeting the requirements of Government and its conception of what is right and proper.

A signed copy of this declaration will be submitted to each of the appropriate departments of government in Washington. After further conference it will take its final form such that no part of it whatever is objectionable to any of these departments. When this is accomplished, the Institute will be ready to begin to function.

Fair Competition

This declaration means that the members will do business in the open and on the square. There will be no secret prices, no unfair discriminations between customers, and all prices will be honest prices, with no form of comeback or concessions whatever. Just how this will be put into practical effect must be determined by the Board of Directors after some study in order that it be done with equal fairness to all. Different methods may well be required in the different phases of the trade. Our first concrete act may well be the appointment of an Advisory Committee to analyze trade conditions and prepare for submission a proposed Code of Trade Practices and methods for making them effective. We should probably be able to adopt an initial code defining such practices as are universally accepted as unfair and such as will be approved by the entire membership and by the Federal Trade Commission without the formality of a trade practices conference. This formal conference may thus be deferred until the industry is fully ready to enter upon it.

I can well understand how it must be the desire of all to get going as soon as possible. On the other hand, we all want to avoid any unwise step as we get started. Considering the magnitude and the newness of our undertaking, we will make most haste by moving a little slowly at first. Meantime, it will be your part to learn the new gospel of fair competition and spread it among your own sales organizations, employing these principles as far as you can individually. From the legal point of view, it is fundamental that our operations must be such as not to put any artificial compulsion upon either seller or buyer. As membership in the Institute is voluntary, a member may resign at any time. Our inspiration is confidence, our only compulsion the dictates of a high sense of honor and justice. It will be my constant task and responsibility to steer for you a clear course in accordance with law. Be frank with me, and I will keep in close touch with the appropriate departments in Washington.

The Rubber Institute will be judged by the results of the operations of its members, not by any policy its declaration may announce. Likewise its success in ultimately putting its members in a position each to run a profitable business will depend upon the sincerity and mutual confidence of its members as evidenced in their individual conduct of business rather than in what they say about it. Actions are going to speak much louder than words. I shall be honest with you individually and with the government and I shall believe that each of you will be completely frank with me. I may be considered a confidential advisor, certainly not a Czar or Dictator, and I hope you will be very free in consulting me in perfect confidence. I shall give my undivided time and energy to making this Institute as rapidly as possible a working machine, designed ultimately to put the rubber industry to the forefront of those large industries whose successful operations in this new field are outstanding exponents of the wisdom of America's industrial policy. But, it must be very clear that I cannot do this alone. The Institute is not a ready made panacea to be handed to you on a platter. It will be your work, and often hard work, which will make it a success. I hope you feel as I do that this should not be undertaken without the determination to put it through. And, we must proceed step by step as study, experience and our own preparation make it possible.

No Conflict of Functions

Let me clear up any question of conflict or overlapping between the present Rubber Association and the new Rubber Institute. P. W. Litchfield, president of the Rubber Association, and A. L. Viles, general manager, have discussed this matter frankly with me and are confident that we can function without overlapping and in close cooperation. Every experienced institute executive whom I have consulted has told me that the best qualification for leadership is a complete ignorance of the industry's technique, previous traditions and prejudices, etc. I certainly qualify in that particular.

Board of Directors

Immediately following these remarks designated representatives of those corporations desiring to become members went into executive session and selected a board of fifteen directors for the Rubber Institute to be named in the certificate of incorporation as the Directors of the Institute until the first annual meeting in June, 1929.

Organization Declaration
of
The Rubber Institute, Inc.

IN meeting the forces of modern economic conditions, the individual rubber products manufacturer has stood alone, even without that knowledge of trade data to which he is legally entitled. He has, therefore, practically been forced to engage in ignorant and often ruthless competition, which has resulted in unsound and uneconomic merchandising, trade practices destructive of stability, leading to unfair discrimination between customers, and denying to individual efficient management the advantages of wholesome competition and an opportunity to do business with an adequate financial return. The industry recognizes its need for that cooperation in wholesome competition which has been brought about in other large industries through the lawful activities of trade institutes.

It is therefore proposed to organize The Rubber Institute, Inc., for the following purposes:

To promote in the industry a mutual confidence and a high standard of business ethics; to eliminate trade abuses; to promote sound economic business customs and practices; to foster wholesome competition; to provide ultimately for individual efficient business management operating independently an opportunity to do business with an adequate return; and thus generally to promote the service of the industry to the public welfare.

Believing wholeheartedly in the American principle of preserving unimpaired the independence of the individual manufacturer and the maintenance of the principle of wholesome competition between manufacturers, the plan and the future code of trade practices of the proposed Institute are founded upon the following principles:

1. Adherence to law, and particularly to those prohibiting the fixing of prices, the allocation of or discrimination between customers, the allocation of territory, and the control of production in restraint of trade.

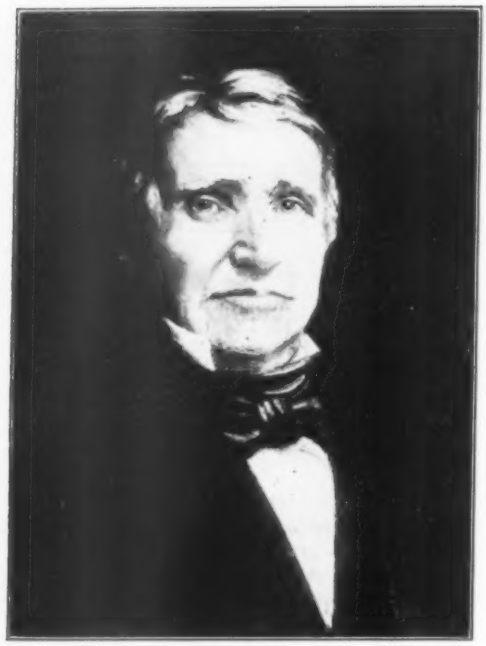
2. The avoidance of unfair discrimination between customers. To that end, rubber products should be sold only upon prices and terms made by each member acting independently and immediately thereafter publicly announced. No member would be obligated to any other member or to the Institute to continue the use of such prices or terms for any period, but would reserve the right to change them at will, and would announce any departure from the same immediately that it is made.

3. These announced prices and terms should be absolutely net, without any form of secret price concession whatever. A secret price concession in any form whatsoever if employed with one customer is discriminatory unless employed with all like customers. If thus uniformly employed it amounts to a general price concession which should frankly take the form of a price reduction. Any possible form of price concession is unethical, except when practiced openly; and is discriminatory unless uniformly employed.

A code of trade practices for the Institute in keeping with the above principles which will definitely describe certain practices as unfair will be developed in consultation with the Federal Trade Commission as experience, necessity and the judgment of the members of the Institute may determine.

We, the undersigned, hereby associate ourselves as members of The Rubber Institute, Inc., and hereby severally subscribe to the above; subject, however, to the same being submitted to the Department of Justice of the United States of America and the Federal Trade Commission, and no objection being raised to any part of the same by either department.

J. A. LAMBERT
Acme Rubber Mfg. Co., Trenton, N. J.
S. T. CAMPBELL
Aetna Rubber Co., Cleveland, O.
H. L. McCLAREN
Ajax Rubber Co., Inc., New York, N. Y.
E. D. BOYER
American Hard Rubber Co., New York, N. Y.
A. H. CANFIELD
Canfield Rubber Co., Bridgeport, Conn.
N. L. GREENE
Clifton Mfg. Co., Jamaica Plain, Mass.
H. R. YOUNG
Combination Rubber Mfg. Co., Trenton, N. J.
W. C. HOOVER
Cord Tire Corp., Chester, W. Va.
C. D. DICKEY
Corduroy Tire Co., Grand Rapids, Mich.
C. A. HAMMOND-KNOWLTON
Crown Rubber Co., Omaha, Neb.
E. B. GERMAIN
Dunlop T. & R. Corp., Buffalo, N. Y.
C. D. GARRETSON
Electric Hose & Rubber Co., Wilmington, Del.
EBERHARD FABER
Eberhard Faber Rubber Co., New York, N. Y.
F. H. COMEY
Falls Rubber Co., Cuyahoga Falls, O.
C. E. PUMPHREY
Fidelity Tire & Rubber Co., Warren, O.
H. S. FIRESTONE
Firestone Tire & Rubber Co., Akron, O.
H. T. DUNN
Fisk Rubber Co., New York, N. Y.
W. O'NEIL
General T. & R. Co., Akron, O.
J. D. TEW
B. F. Goodrich Rubber Co., Akron, O.
P. W. LITCHFIELD
Goodyear Tire & R. Co., Akron, O.
A. BOYD CORNELL
Hamilton Rubber Mfg. Co., Trenton, N. J.
THOMAS MATCHETT
Hewitt Gutta Percha Rubber Corp., Buffalo, N. Y.
F. C. HOOD
Hood Rubber Co., Watertown, Mass.
J. M. ALDERFER
India Tire & Rubber Co., Akron, O.
LOUIS ALEXANDER
Industrial Rubber Corp., Long Island City, N. Y.
SAMUEL WOOLNER, JR.
Kelly-Springfield Tire Co., New York, N. Y.
A. A. GARTHWAITE
Lee Rubber & Tire Corp., Conshohocken, Pa.
A. F. TOWNSEND
Manhattan Rubber Mfg. Co., Passaic, N. J.
J. H. MICHELIN
Michelin Tire Co., Milltown, N. J.
W. F. PFEIFFER
Miller Rubber Co., Akron, O.
S. S. MILLER
Mohawk Rubber Co., Akron, O.
P. G. HIMMELWRIGHT
Monarch Tire & Rubber Co., Hartville, O.
THOMAS MORRISON, JR.
Murray Rubber Co., Trenton, N. J.
L. J. SCHOTT
Northern Rubber Co., Barberton, O.
J. W. WHITEHEAD
Norwalk T. & R. Co., Norwalk, Conn.
A. L. SCHAFF
Overman Cushion Tire Co., Belleville, N. J.
J. SCHWAB
Salem Rubber Co., Salem, O.
F. A. SEIBERLING
Seiberling Rubber Co., Akron, O.
J. B. GABELINE
Standard Four Tire Co., Keokuk, Iowa.
OTTO BASTEN
Sterling Tire Corp., Rutherford, N. J.
C. B. SEGER
U. S. Rubber Co., New York, N. Y.
F. B. WILLIAMSON, JR.
Whitehead Bros. Rubber Co., Trenton, N. J.



Charles Goodyear

Sulphur *and* Selenium[1]

Pioneering Discoveries of Charles Goodyear and Thomas Hancock the Basis of the Rubber Industry Characteristics and Chemical Effects of Sulphur and Selenium in Vulcanization

By WEBSTER NORRIS

A CENTURY ago the efforts of the experimenters in rubber were quite naturally directed, both in Europe and America, largely to the production of weatherproof clothing and footwear. The failure to make merchantable goods was inevitable because the rubber was practically destroyed by its solution in turpentine, oils, etc., with or without the addition of many sorts of compounding constituents, including sulphur. Dependence was placed on the use of some drying means to eliminate extreme tackiness and the inevitable tendency of the rubber mixing to decompose on aging, especially under summer conditions.

Successful production of rubber goods did not begin until the principle of vulcanization by heat and sulphur was discovered, first by Charles Goodyear in America during the winter of 1838-39, and patented in 1844; and independently by Thomas Hancock in England, patented by him in November, 1843. Both these pioneers of the rubber industry are justly regarded as the founders, in their respective countries, of the rubber industry. Each published the account of his efforts as an experimenter, inventor and manufacturer, and the reader is referred to these publications for the authentic records of their work.[2]

Sulphur

Since the days of Goodyear and Hancock, sulphur has been the only compounding material indispensable for vulcanization. All other vulcanizing agents are auxiliary. They have, however, advanced the making of vulcanized rubber goods to a degree impossible by sulphur alone. The chemical element sulphur is widely distributed in nature, particularly in the form of metallic sulphides. In Sicily and Louisiana large deposits of the native element occur and furnish most of the sulphur used in the world's industry.

Sicily formerly produced the bulk of the world's requirements. There the sulphur occurs mixed in limestone and is extracted from the rock by igniting it in large stone kilns. About a third of the sulphur is consumed in heating the rock to liberate the rest of the sulphur which melts and runs out at the bottom of the kiln. In marked contrast with this wasteful method is that now used for obtaining sulphur from the deposits located 1,000 feet below the surface in Calcasieu Parish, Louisiana. This efficient way of mining sulphur is the invention of Herman Frasch, also inventor of the process for removal of sulphur from petroleum.

The system consists in forcing superheated water through pipe wells down into the sulphur deposit. The sulphur is thus melted and is raised with the hot water to the surface by an air lift system. The liquid sulphur is received in enormous bins erected on the ground from which, when cool, it is blasted and loaded into cars for transportation. The sulphur thus obtained is practically pure.

In a sulphur works the broken sulphur is melted in a furnace from which it is drawn off into wooden gang molds giving it the form of stick sulphur or brimstone. This is broken up, ground and screened to the fineness of flour and barreled for rubber compounding and other purposes.

Chemical Nature of Sulphur

The atomic weight of sulphur is 32 and its specific gravity is 2.00. Its molecular condition varies with its temperature. Up to its boiling point, 788 degrees F., the sulphur molecule contains 8 atoms, and reduces in number as the temperature rises. Above 700 degrees C. the molecule contains 2 atoms only. Dr. Carl Otto Weber considered that vulcanization proceeded only when the S_8 molecules were disassociated into S_2 molecules. This disassociation and the rate of vulcanization increase with temperature.

The fact that sulphur changes its molecular condition only slightly at high temperatures explains why an excess of sulphur is necessary for practical vulcanization. The presence of uncombined sulphur in rubber either before or after vulcanization gives rise to the phenomenon of blooming by which is meant the migration of the sulphur to the surface

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[1] Copyright, 1928, by Webster Norris. Continued from INDIA RUBBER WORLD, June 1, 1928, pp. 57-59.

[2] "Gum-Elastic and Its Varieties with a Detailed Account of Its Application and Uses and of the Discovery of Vulcanization." By Charles Goodyear. Vol. I. New Haven. Published for the Author, 1855.

"The Applications and Uses of Vulcanized Gum-Elastic with Descriptions and Directions for Manufacture." By Charles Goodyear, Vol. II, New Haven. Published for the Author, 1853.

"Personal Narrative of The Origin and Progress of the Caoutchouc or India Rubber Manufacture in England." By Thomas Hancock. Published by Longman, Brown, Green, Longman & Roberts, London, 1837. Centenary Edition, Reprinted by Order of the Directors of James Lyne Hancock, Ltd. Vulcanized Rubber Works, 266 Coswell Road, London, E. C. 1920.

of the rubber where it appears as a more or less abundant dusty crystalline deposit. The presence of such excess free sulphur in rubber goods not only damages them from a sales point of view but is the direct cause of reducing the aging quality of the goods.

Compounding with Sulphur

Goodyear's rule for the proportion of sulphur to rubber for vulcanization of general lines of soft rubber was one-half ounce of sulphur to one pound of crude rubber. This is equivalent to 3.10 per cent on the rubber and, as an average, still applies. The proportion of sulphur to rubber in modern practice varies from 1 to 5 per cent, according to circumstances such as the use of accelerators, reclaims, etc.

For curing hard rubber, sometimes called vulcanite or ebonite, the proportion of sulphur is varied from 25 to 50 per cent on the rubber, dependent on the quality of the product and the purposes for which it is designed.

Sulphur Chloride

Sulphur mono-chloride is the volatile active sulphur reagent used for vapor and cold curing of thin rubber articles, such as novelties and dipped goods. This sulphur reagent is obtained by the reaction of dry chlorine with flour of sulphur or molten sulphur. It is a clear yellow, poisonous, oily liquid, fuming violently in the air and has an irritating effect on the nose and throat. Its specific gravity is 1.688, boiling point 281 degrees F. It should be stored in a dark place and kept free of contact with moisture.

Vapor Cure

Goods, such as dipped gloves, are usually cured by exposure to the vapor of sulphur chloride in an enclosed space at 180 degrees F. for an hour, more or less, varying with the humidity of the weather. In both acid and vapor curing it is quite necessary that the goods be thoroughly dry of both naphtha and moisture.

Acid Cure

Vulcanization by the "acid cure" is effected by immersion of the dried dipped article on its form into a curing bath consisting of sulphur chloride and carbon bisulphide. The ordinary proportions are 4 liquid ounces of the former to 5 gallons of the latter. The time of immersion necessary for thorough cure varies from 15 to 60 seconds, according to the thickness of the rubber. In the case of nipples after acid curing them on the outside they are removed from the forms and curing acid is poured into them to cure the inner surfaces.

Selenium

Selenium is one of 85 or more elements found in nature. It is seldom free, but occurs usually with other metals in ores, and is obtained in the electrolytic refining process. Its molecular weight is 79.2, or about 2½ times that of sulphur. Its chemical properties resemble those of sulphur and it belongs in the same group of the periodic system.

When selenium is mixed with rubber and heated under vulcanizing conditions a product results somewhat like that obtained with sulphur. Selenium and sulphur are allied in vulcanizing properties and may be used together very successfully. If the usual organic accelerators are also present, a very tough, rigid, high modulus cure results.

In addition to the increased rigidity and high modulus, greatly improved abrasion qualities are produced by selenium. This increased resistance to abrasion is greater than can be obtained by the use of increased accelerator and harder cure with sulphur alone.

It would seem as if the selenium produces an entirely new chemical combination with the rubber molecule in addition to the sulphur combination. Compounds vulcanized to a correct cure with selenium and sulphur age very well, and especially when they contain an anti-oxidant.

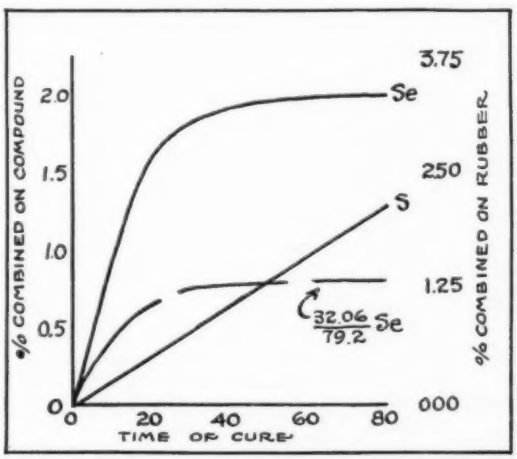
Stocks containing selenium can be cured non-blooming but when 1.5 per cent on the rubber is used a greenish bloom appears similar, except in color, to sulphur bloom. Sulphur and selenium when used together invariably shorten the cure. Any of the commercial accelerators work well in combination with selenium.

C. R. Boggs and E. M. Follansbee[3], summarize as follows the results of their extended investigation of selenium in rubber mixings[4]:

> Selenium acts as a vulcanizing agent to produce soft vulcanized rubber. When selenium and sulphur are used together to produce soft vulcanized rubber, the selenium acts as an efficient accelerator as well as a vulcanizing agent. Tire tread compounds vulcanized with selenium and sulphur in the presence of organic accelerators show abnormally high rigidity and abrasion resistance. This result is obtained with a variety of filling materials and accelerators. The other physical properties are practically not affected. It is suggested that the accelerating action produced by the selenium is due to selenium sulphide and that the abnormal physical results are due to the selenium and sulphur together adding to the rubber molecule.

The temperature necessary to cure selenium (no sulphur) compounds with suitable accelerators is the same as that for compounds vulcanized by sulphur and like sulphur compounds, the higher the temperature, the shorter is the time to reach "optimum" cure. Compounds vulcanized by selenium give on the average better aging properties than those cured by sulphur. They are not so sensitive to time of cure and a "plateau" effect is obtained. A compound containing 30 per cent rubber by weight, one per cent of para-nitroso-dimethyl-aniline, and 14 per cent selenium (calculated on the rubber) with suitable fillers, shows very little deterioration after 8 years. When new this compound had an average tensile strength of 900 pounds and a 400 per cent elongation. After 8 years of aging, the tensile and elongation had only decreased by 8 per cent.

Concerning sample mixings containing high percentages of carbon black the authors state that the best cure was obtained between 40 and 60 minutes. Between these limits the selenium and sulphur seem to combine with the rubber in the ratio of their atomic weights.



Rates of Combination of Sulphur and Selenium with Rubber

The graph herewith, shows the rapid combination of selenium at the beginning of the cure succeeded by much slower combining after 40 minutes at which point the curve assumes a flat or "plateau" effect. On the contrary the curve

[3] Simplex Wire & Cable Co., Boston, Mass.
[4] "Selenium in Rubber Compounds" read at a meeting of the London and District Section of the Institution of Rubber Industry, Nov. 23, 1926.

Typical Compounds Vulcanized with Selenium (Vandex)

MECHANICAL STOCK

Rubber	100.0
Mineral rubber	10.0
Zinc oxide	10.0
Dixie clay	10.0
Sussex whiting	10.0
Thermatomic carbon	10.0
Carbon black	10.0
Stearic acid	2.0
Pine tar	2.0
Age Rite	1.0
Captax	0.5
Sulphur	2.5
Vandex	**1.0**
	169.0

Cure 60 minutes at 274° F.

RECLAIM STOCK

Whole tire reclaim	100.0
Zinc oxide	3.0
Stearic acid	1.0
Captax	0.3
Sulphur	3.0
Vandex	**1.0**
	108.3

Cure 10 minutes at 287° F.

TIRE TREAD WITH RECLAIM

Rubber	75.0
Tube reclaim	40.0
Mineral rubber	5.0
Zinc oxide	5.0
Carbon black	40.0
Pine tar	1.0
Stearic acid	3.0
Age Rite	1.0
Captax	0.5
Sulphur	3.1
Vandex	**1.0**
	174.6

Cure 60 minutes at 258° F.

TAN SOLE STOCK

Rubber	25.00
Red tube reclaim	15.00
Mineral rubber	6.00
Zinc oxide	5.00
Magnesium carbonate	35.00
Dixie clay	10.00
Stearic acid	2.00
Age Rite	0.50
Captax	0.40
Sulphur	1.25
Vandex	**0.50**
	100.65

Cure 5 minutes at 307° F.

MECHANICAL STOCK

Rubber	70.0
Tire reclaim	54.0
Mineral rubber	10.0
Zinc oxide	10.0
Dixie clay	10.0
Sussex whiting	10.0
Thermatomic carbon	10.0
Carbon black	10.0
Stearic acid	2.0
Pine tar	2.0
Age Rite	1.0
Captax	0.5
Sulphur	2.5
Vandex	**1.0**
	193.0

Cure 45 minutes at 274° F.

TIRE FRICTION

Rubber	100.0
Mineral rubber	5.0
Zinc oxide	5.0
Stearic acid	1.0
Pine tar	2.0
Age Rite	1.0
Captax	0.3
Sulphur	2.0
Vandex	**0.5**
	116.8

Cure 30 minutes at 287°F.

Recommended by R. T. Vanderbilt Co.

indicating the combination of sulphur with the rubber shows a continuous straight line without decrease of rate.

Regarding the effect of reclaim in stocks cured with selenium, Boggs and Follansbee found that rubber may be replaced by reclaimed rubber, volume for volume, within limitations without decrease in abrasion resistance if a small amount of selenium is used.

Organic Selenium Compound

Several patents have been granted on the use of selenium and selenium compounds used in rubber.[5] The compound known as selenium diethyldithio-carbamate is very similar in action to Tuads or tetra-methyl-thiuram disulphide. When used in sufficient quantity it acts as a vulcanizing agent similar to sulphur.

Vandex is the trade name of mineral selenium particularly prepared and refined for the vulcanization of rubber.

This material makes selenium vulcanization available in all classes of rubber work except insulation of wire and cables. For the latter class vulcanization by selenium and its compounds is specially reserved by the inventors.

The chief advantages obtained by selenium vulcanization are the increase in abrasion resistance of high grade compounds and the possibility of using even larger quantities of reclaim without sacrificing wear resisting properties. The following tabulations show the effect of this selenium compound in influencing the abrasive wear index in zinc oxide and carbon black stocks accelerated with Tuads. When Vandex is added to increase the vulcanizing agents the amount of Tuads is decreased so as to maintain the same rate of cure for the two mixes under comparison.

The effects produced by Vandex are, a greater stiffness or rigidity, usually considerable increase in tensile strength on short cures, some decrease in stretch, increased hardness, greatly improved resistance to abrasion as determined by standard laboratory abrasion machines, and increased quality in friction stock as determined by either stripping or flexing machines.

[5] C. R. Boggs, Simplex Wire & Cable Co., U. S. patents Nos. 1,249,272, and 1,364,055. P. I. Murrill, R. T. Vanderbilt Co., U. S. patents Nos. 1,622,534, 1,622,535, and 1,622,536.

Selenium and Abrasive Resistance

	A	B
Rubber	100.00	100.00
Zinc oxide	120.00	120.00
Mineral rubber	4.00	4.00
Stearic acid	1.00	1.00
Age-Rite	1.00	1.00
Tuads	0.25	0.10
Sulphur	4.00	4.00
Vandex	..	1.50
Cure 10 minutes at 270 degrees F.		
Tensile at break	3,660	2,860
% Elongation at break	650	620
Resistance to abrasion	100	125
Cure 25 minutes at 270 degrees F.		
Tensile at break	3,660	3,700
% Elongation at break	630	620
Resistance to abrasion	104	134
Cure 40 minutes at 270 degrees F.		
Tensile at break	3,400	3,500
% Elongation at break	620	610
Resistance to abrasion	113	144

Similar results are shown in a mix containing a large amount of carbon black accelerated with Captax.

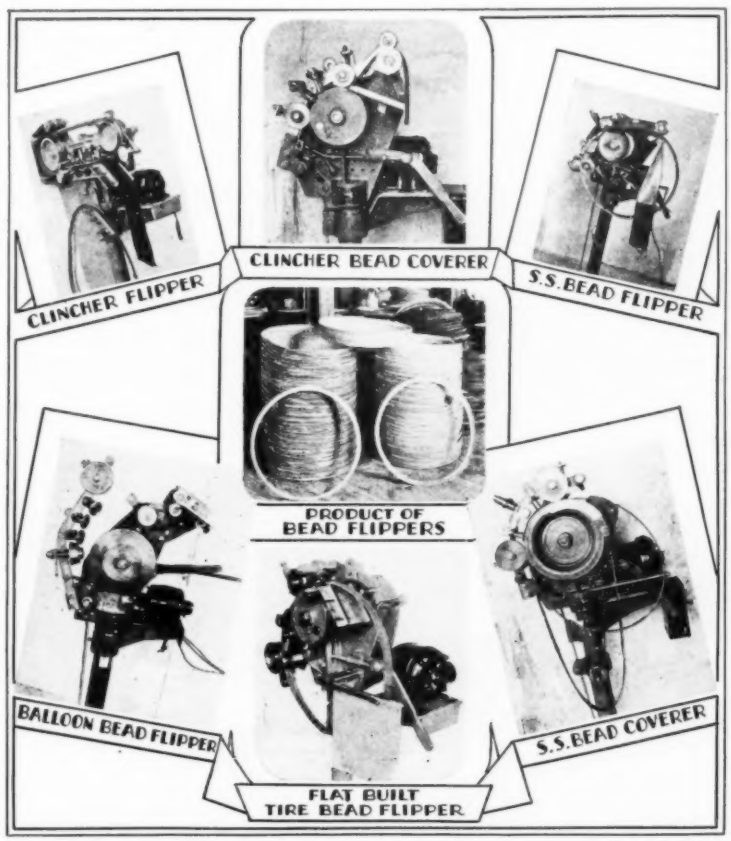
	A	B	C
Rubber	100.0	100.0	100.0
Mineral rubber	5.0	5.0	5.0
Zinc oxide	5.0	5.0	5.0
Carbon black	40.0	40.0	40.0
Degras	2.0	2.0	2.0
Stearic acid	4.0	4.0	4.0
Age Rite	1.0	1.0	1.0
Captax	0.6	0.6	0.6
Sulphur	3.0	3.0	3.0
Vandex	.....	1.0	1.5
Cure 30 minutes at 287 degrees F.			
Tensile at break	4,500	4,800	5,020
% Elongation at break	640	625	570
Resistance to abrasion	100	169	194
Cure 45 minutes at 287 degrees F.			
Tensile at break	4,680	4,660	4,520
% Elongation at break	640	560	510
Resistance to abrasion	102	152	192

The foregoing abrasive resistance tests were made by a loose abrasive type of machine.

Tire Bead Covering and Flipping

This Article Written by a Practical Tire Man Illustrates and Describes the Most Popular Methods of Bead Making, Covering and Flipping That Are Used in Modern Tire Practice

PROBABLY the most exacting department in a tire manufacturing plant from a mechanical point of view is that devoted to making beads, and one of the most important operations in preparing the bead is the covering and flipping operation. This must be done exactly right or trouble may be expected when the tire has been put in service. Many types of beads have been developed in the various tire factories conforming to ideas of the tire engineers and designers. Those in most common use are shown in the illustration of flippered bead sections and they are numbered for the reader's convenience and reference.



Six types of specially designed Utility bead flipping and covering machines and their products are here shown. They include clincher flipper and coverer, straight side flipper and coverer, balloon flipper, and flat built tire bead flipper

In addition to the clincher, there are two other general types, the cable bead, in which piano wire of various gages is used and that made from the flat braid wire of several gages and varying in the number of strands.

The most difficult bead to process in covering and flipping is the clincher, as the core which may be of fabric or rubber is easily stretched or distorted by mishandling. For this reason, and until machinery was developed for flipping clincher beads, many manufacturers preferred to eliminate the flipper strip and anchor the bead in place in the carcass by means of multiple chafer strips. The result of much effort to perfect a machine for flipping clincher beads resulted in the clincher flipper, shown in the group illustration, which applies the flipper strip without twisting, stretching or distorting the core in any way. This is accomplished by means of rollers machined to the exact contour of the bead which convey it through the machine without strain or tension on the core. The fabric cover or flipper strip is applied by folders and rollers which fit it closely to the core. Beads may be flipped in continuous lengths or made to exact size on the machine and beads molded in a circle are also easily and perfectly handled without stretching or distortion. The different types of flipping as done on this machine are shown as sections 16, 17, 18, and 19 in the group of bead sections shown on the next page.

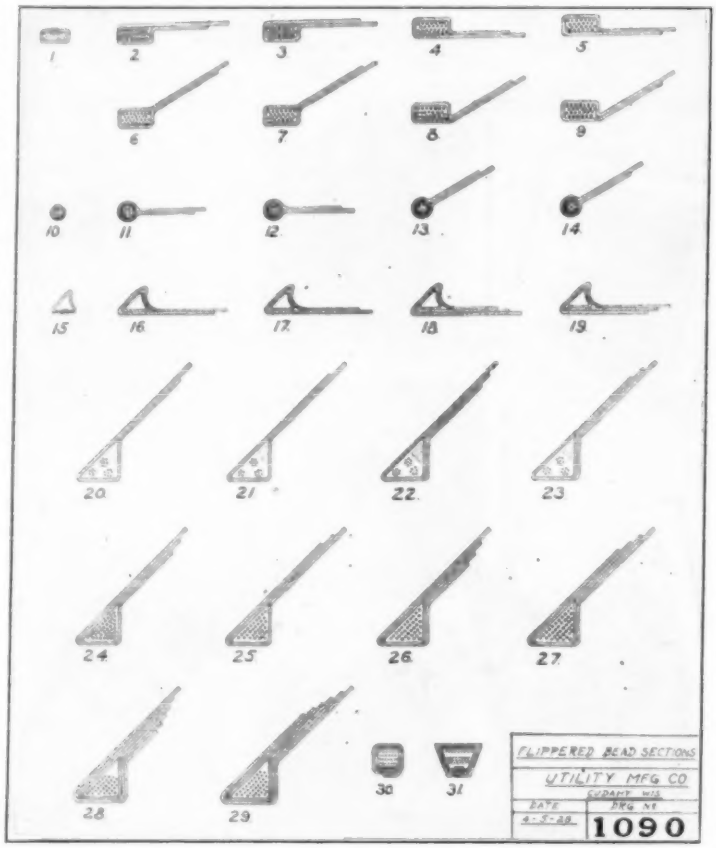
A companion to this machine is the clincher bead coverer that is designed to apply a cover to the cured or uncured clincher bead core before flipping, as shown in section 15, as many shops prefer to apply a cover before blooming appears on the tubed or molded core. The machine is shown in the accompanying illustration.

The first of the straight side bead flipping machines to be offered to tire manufacturers, and pictured in the group, is of comparatively simple design, the flipper strip being fed with the bead between two wheels, the larger being power driven and the smaller having a spring tension which exerts sufficient pressure to attach the strip securely to the bottom of the bead. The skirt of the flipper next passes between stationary

"plows," adjusted to turn it to the desired angle and the two edges are finally stitched together between "sealer wheels" or rollers. Sections 20 and 21 show examples of work done on this flipper. Comparatively narrow strips and only those which are bias cut can be used on the machine as the skirt of the flipper is stretched to make up the difference between the inside and outside circumferential dimensions.

This machine was in general use until the advent of the balloon tire when it was felt that this type of flipper, while perfectly satisfactory in the high pressure tires with the heavier sidewall construction might cause unnecessary strain in the comparatively thin sidewalls of balloon tires, due to the stretching of the flipper skirt.

The result of effort to design a machine which would obviate this condition is the crimper flipping machine shown in the picture as the balloon bead flipper. This applies the flipper strip without distortion or stretching of the fabric weave and has the added advantage of design which permits the use of lighter fabrics. As in the original machine the bead is placed between a power driven "bull" wheel and a companion wheel equipped with a spring tension which exerts sufficient tension on the bead core to rotate it. The flipper strip is fed between a pair of gears which crimp or tuck and thereby shorten the center of the fabric strip where it is applied to the inside circle or bottom of the bead. The turning up of the skirt is accomplished by means of a series of free wheels or stitchers set at the desired angle. The flipper is tacked to the bead by a sealer wheel machined to the exact contour of the bead and acting against the inner face of the "bull" wheel. The same operation seals the skirts of the flipper together.



The above illustration shows a number of different shaped beads made by various methods of flipping or covering. These only illustrate the method and do not show the many different widths of fabric that may be used.

Beads as shown in sections 13, 14, 20, 21, 22 and 23 may, with different attachments, be flipped on this machine. All the beads with the extension turned up at an angle are done on the crimper type bead flipper which shortens the center of the bead cover and, therefore, sets it around the bead without strain and with no tendency to curl back. The coverings for large truck tire beads as shown in sections 28 and 29 have three plies of heavy square woven fabric which is plied up first and then formed and set around the bead at one operation by the crimper or balloon bead flipper.

In making up the straight side tire bead several methods are in vogue. In using single strand piano wire this may be run to size and the required number of turns on a bead making machine and a cover strip, skim coated, then applied by the straight side bead coverer shown in the group picture, after which the flipper strip is applied.

The flat braid wire bead seems to be most popular with manufacturers and is in more general use than any other type of wire. In making beads from flat braid wire one method is to pass the wire through a tuber head which applies an insulating coating of rubber compound. It is then wound to the required number of turns on a bead making machine and is ready for covering or flipping. Another method which eliminates the tubing machine operation is to use a cover strip on which a skim coat of about 90 points has been applied. This strip is laid around the head of a bead making machine, the wire filler fed on to the required number of turns and secured in place by lapping the cover strip.

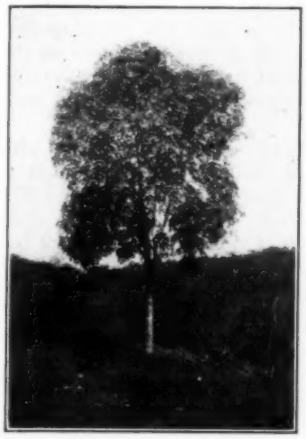
Following either of these methods of making the bead the further processing methods vary. One method is to mold the bead to triangular shape, a three minute press cure usually being sufficient for this purpose. In some plants this practice has given way to that of "cold pressing" the beads to shape and is said to be entirely satisfactory on certain types of tires. In either case a flipper strip is applied by the crimper flipping machine. In general this machine, with different fittings to accommodate the various contours of beads, may be used where it is desired to set the skirt at any angle except the horizontal.

Many tires, especially the balloon type, are now made by the flat band process and this requires a somewhat different makeup of bead. The usual practice is to form the bead without pressing or molding and then to apply a cover strip by the straightside bead covering machine shown in the picture. The operation is similar to a flipping machine except that there are no fittings for extending the skirt. The covering stock is usually prepared in rolls and the machine pulls this stock from the roll and folds it to place around the wire filler by means of folders. A free wheel stitcher seals the fabric lap. Cover strips may be "booked" and fed to the machine direct from the bookboard instead of prerolling. Sections 1 and 10 are examples of the work done on this machine.

The machine for flipping beads for flat built tires is also shown and applies the strip and extends the skirt as shown in sections 2, 3, 4, 5, 11, and 12. Covering machines are now in service covering automobile fan belts, sections 30 and 31 illustrating this type of work.

Grafting Hevea on Castilla

Nearly every one of the many surprises that have come to the rubber industry since Goodyear's day had been deemed impossible. It may be that another one is impending, perhaps a radical development in rubber culture that many may now consider infeasible. Neither sponsoring nor deprecating the proposed grafting of Hevea upon Castilla, the following article is published in an open-minded spirit. It would be unreasonable to assume that merely because a thing has not been done therefore it may not be done; nor should encouragement be withheld if an earnest endeavor is to be made to enhance the supply and quality of crude rubber, especially from subtropical America



WHAT may be the first step in starting a great revival of rubber growing in Central America is about to be taken by an American corporation which has long raised various crops on a 5,000-acre plantation. About 500 acres contain nearly 100,000 Castilla trees that were planted some twenty years ago, most of them now having trunks two feet in diameter; and it is proposed to graft choice budded Hevea stock on these trees. Thus it is planned to quickly develop an orchard of high yielding Para rubber trees. The sturdy trunks and well-set root system of the Castilla trees will be utilized, but practically all the rest of the trees above ground will be got rid of when the Hevea trunks begin to grow upon the supporting Castilla stumps. Cultural conditions are said to be remarkably favorable, and it is probable that if the unique experiment evidences any success many concerns having dormant or neglected Castilla plantings may at once follow suit; and a strong incentive will also be provided for direct and extensive planting of Hevea.

After thinning out the trees, now set fifteen feet apart, the bud grafting will be attempted, the material being obtained only from branches of such Hevea trees as have been proved to be of superior strain, these being either imported or locally cultivated. Special stress will be laid on the vigor, disease resistance, and high latex bearing quality of the parent stock. The grafting, it is said, will be done in much the same way as it is effectively practised in the Far East. An oblong section of bark will be carefully removed from the base of each Castilla tree and to the bared cambium will be promptly affixed a patch of precisely the same size cut from a young branch of Hevea containing a bud. After applying slight pressure to express excess fluid from beneath the patch, the latter will be bound to the tree for a couple of weeks with a strip of cheesecloth steeped in paraffin to exclude air and moisture, to keep the patch from drying out, and to assist in the union of graft and trunk. Absolute cleanliness is required in the operation.

The next step in the proposed process, when it is evident that the patch has attached itself, will be to force the growth into the Hevea bud graft. This, it is believed, can be done by cutting off the Castilla trunk a little above the graft and sealing the exposed part with any cement that will check sap bleeding and prevent decay. With proper attention to weeding inasmuch

Answering Botanical Objections

That Hevea can be successfully grafted on Castilla is doubted by botanists because the trees are of different genera, Castilla being a genus of the Moraceae family and Hevea of the Euphorbiaceae.

Stepping-up rubber production through a union of unlike latex-bearing trees is not a novel idea. Courtenay De Kalb, writing on "Grafted Hevea an American Possibility" in INDIA RUBBER WORLD, January 1, 1924, suggested that a hybrid affording much latex might be formed between the paragon species *Hevea brasiliensis* and the species *Morus rubra*, or red mulberry, of the same family as the Castilla, and which also abounds in laticiferous glands.

Admitting that hybridization is best effected between members of the same genus, Mr. De Kalb declared that it has nevertheless been accomplished, citing the crossing of the rhododendron and the azalea as an example, both being as distinctly related as the Hevea and the Morus. He added that if hybridization or cross-fertilization failed to give the result desired, it might then be obtained by grafting, or by the closely-allied process of budding.

as the Castilla, like its congener, the Hevea, is an avid surface feeder with a considerable part of its root system close to the top of the soil, it is believed that the grafted trees will make rapid growth and should attain maturity in much less time than Hevea trees planted in the customary way.

It was noted that the tendency of budding is to make tender plants hardy, that grafting was well suited to plants propagated from cuttings, and many rubber trees were raised from them. The striking success achieved by walnut growers in the Southwest in improving strains is suggested. A few years ago walnut groves were planted wholly from seeds; now the trees are propagated almost wholly from carefully selected budded stock, and not only has the yield been much increased but the nuts are larger, thin-shelled, meaty, and well flavored. The big change in the industry came about when the English walnut was bud grafted to the trunks of native black walnut trees. In such propagation the old walnut seedlings are cut off a foot or two from the crotch, the buds inserted, and fixed with grafting wax. The buds could be placed lower, an expert states, but the branches would hang too low on account of the tree's habit, which is very unlike the upstanding Castilla or Hevea.

As is well known, Castilla is indigenous to Costa Rica, as it is to Mexico and a large part of Central America, and considerable wild rubber gathered by the natives is marketed under various names. Owing to the decrease in the price of rubber since the trees were planted, to defective planting, to the small yield per tree, as compared with Hevea, to the higher cost of labor, and to the fact that sugar, coffee, cattle, bananas, and other products are giving better profits, the owners of plantations have largely neglected their rubber holdings or lessened them to raise other crops. In the United States Government crude rubber survey it was observed that not only were there thriving groves of Hevea in Costa Rica, but that soil and climate in an area of about 1,000,000 acres on the Caribbean side of the country appear to be very well adapted for raising Hevea, as well as Castilla.

Crude Rubber Price Insurance

The meaning and advantage of hedging as practised on the New York Rubber Exchange is well worth the effort required to get a clear understanding of this price insurance and become expert in noting when and how far to apply it. For example a manufacturer bought 10 tons of rubber for October delivery at 37½ cents and finds the market tendency downward and liable to continue so. He is naturally interested to learn how he can minimize his loss. The matter is properly handled by so-called hedging operations, really price insurance trades, on the Rubber Exchange in the following way.

The manufacturer sells four contracts on the Exchange amounting to 10 tons, for December delivery at the market price then prevailing of 37.30. This protects his loss by about a quarter of a cent and involves a commission of $60. Should the anticipated decline of the market occur and when his actual rubber is delivered at the factory the prevailing price is 34½ cents, his loss on his actual rubber is 3 cents per pound or $672, but as he has sold an equivalent amount on the Exchange at $37.30 for December, and the December exchange price is now $34.20, he buys in his four exchange contracts, thereby making a profit of $694.40. From this he must deduct his exchange commission of $120, leaving him a profit on his exchange transaction $574.40, or in other words, the factory has his actual rubber in hand at the then market price and his actual loss is only the difference between $672 and $574 or $98 against a loss of $672 if he had not used the facilities of the Rubber Exchange.

Care and Calibration of a Testing Machine[1]

The following points are particularly applicable to the usual recording or non-recording strength testing machines, with which most rubber laboratories are equipped.

A dynamometer is not necessarily a delicate instrument, but if good service and accurate results are expected it must be given reasonable and intelligent care. Like all machinery it will collect dust, rust and run dry with disastrous results if it is not used properly and given its due share of attention.

The work performed by these machines generates dust and lint, and care should be taken that it does not collect on the machine, especially in the teeth of the gears in the recording head, in the threads of the main stretching screw, and teeth of the curved quadrants.

Rust can be prevented by wiping over the bright parts with an oily cloth. Nickeled parts require little care, but it is impossible to nickel or even lacquer many bright parts. The dial may be cleaned with a soft cloth moistened in clear water using a little good soap if necessary but do not use chemicals.

The recording head needs little oil, but it is important that it should be oiled. The main shaft in the head which carries the drum and weight lever is supported on two ball bearings which should receive a few drops of oil and be kept free of rust and dirt. The pointer shaft passing through the head casting should also be oiled.

All clamps require some attention. The pivots and joints should be kept from drying and sticking and all tightening screws should be oiled both at the pressure end and where the thread engages the nut.

The movement of the control rod is very slight but it must work free and all bearings or holes through which it passes will need lubricating. Wiping the rod with an oily cloth will prevent the adjustment collars and bushings from sticking.

When a stretch scale is used as in a rubber tester, its surface should be oiled to facilitate easy movement of the riders.

The main stretching screw must be kept clean and well oiled. If it becomes dry it will destroy the smooth operation of the tester and will cause a "chatter" or vibration, destroying the value of the results. An occasional drop of oil on the starting handle stud will prevent it from sticking. Also the upright rod extending up from the gear box and operated by the starting handle should be regularly oiled.

All the various moving parts and contacts of course, need sufficient lubrication to insure their smooth working. The parts referred to include the contents of the gear box, bearings of gear shaft and main screw, etc.

Where a recorder is attached, the gear mechanism must be kept well oiled, especially the mechanism operating the recorder clutch. The gearing in the case of the recorder and in the universal joint at the lower end of the flexible shaft are packed in grease and will run for years.

[1] Henry L. Scott Co., Providence, R. I.

BUILDING MATERIAL PRICES WILL SOON ADVANCE AND construction for 1928 will break all records, so trade reports state; and building operations are a good trade barometer. Evidently it is no longer good form to have poor business in Presidential election year. Certainly the outlook for the rubber industry is cheerful, and never was it in a sounder condition.

All that is required to make poverty a blessing is the past tense.—INCOME.

Watch Case Vulcanizers

A Brief Description of the Horizontal and Vertical Types, and a Review of the Patent Literature Relating to Watch Case Vulcanizers

JOSEPH ROSSMAN

THE term "watch case vulcanizers" is applied to that type of vulcanizing apparatus consisting broadly of hinged hollow complementary annular members having recesses or molds to receive a tire or a tube. This term has been picturesquely adopted due to the rough resemblance of the apparatus to a watch having hinged cases which can be readily opened and closed. During the vulcanization process the hinged members are locked together and are heated by steam supplied to the hollow chambers. At the same time fluid pressure is applied internally to the tire or tube. The apparatus is always heated and is never cooled. As soon as a tire is removed from the vulcanizer another tire can be put in to be vulcanized. The operation of this type of vulcanizer is therefore continuous.

In operating a recent type of vulcanizer, only one and a half minutes are required for one man to unlock the mold halves, remove the cured tire, insert an uncured tire, and relock the molds. Quick locking means are provided. The operator merely has to lift the tire and airbag. A single control lever closes the vulcanizer halves, locks them and starts the cure. The reverse operation stops the cure, unlocks the molds and swings the door open for removing the cured tire or tube. The operator then passes on to the next unit and repeats the same operations.

These vulcanizers are conveniently arranged in rows or batteries so that one operator can easily attend to them. The molds are economical to operate and require less labor and equipment to handle than in the prior types of apparatus. A large variety of sizes can be manufactured by the same apparatus more efficiently than with the use of large vulcanizers or presses.

In employing a battery of these vulcanizers only one source of heat is necessary. This is the equivalent of heating a plurality of molds in a single chamber with the ability to control the vulcanization of articles which differ materially, as for instance light inner tubes, heavy tubes for truck tires as well as the usual tires. A saving in fuel is also possible since the molds are never cooled and are in continuous use. One patent states that there is approximately an eighty per cent saving of fuel and a fifty per cent saving of time in using this type of vulcanizer.

The Horizontal Type

There are two broad classes of watch case vulcanizers, the horizontal and the vertical type. In the horizontal vulcanizer the mold sections are hinged horizontally. The lower section is usually fixed and the upper section is arranged to swing open. This was the first type of watch case vulcanizer to be developed.

An early patent No. 617,414 granted in 1899 discloses the germ idea for this type of vulcanizer. The patent shows heated platens which can be moved apart to allow the insertion of a mold between them. This mold consists of two hinged complementary sections. It is provided with rollers which run on a track. The mold is easily withdrawn from the press and the vulcanized article removed. Another article is then inserted and the operation repeated. This structure is however remote from the present horizontal vulcanizer.

Patent No. 658,471 granted in 1900 to Seiberling shows a horizontal watch case vulcanizer resembling those in use today and operating on the same principle. Referring to the accompanying illustration, 1 is an annular hollow metallic case supported on legs 2. Extending from one side of this case are arms 3, having semicircular notches 4 to form bearings for the opposite case of the press, and lugs projecting from its inner periphery and provided with bolt holes for attaching the lower mold. Above this case is a similar annular hollow case 6, adapted to rest on and register with the case 1 and provided with similar lugs 7, having bolt holes for attaching opposite molds and having hollow journals 8, adapted to rest in the bearings 4 and internally connected with the case 6. A handle for raising this case and mold is also provided.

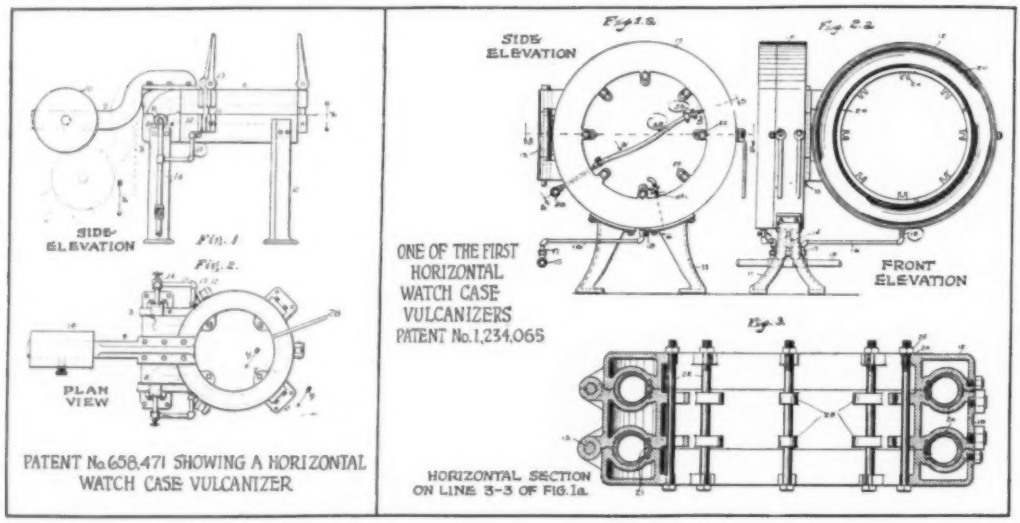
The case 6 is provided with an arm 9 and counterweight 10, retained by a set-screw to permit the upper case to be easily raised. The cases 1 and 6 are locked together by means of links 11, pivoted between lugs 12 on the lower case 1 and resting between similar lugs on the upper case 6 and drawn tight by forked pivoted levers 13, having eccentric ends that bear on the upper face of the case 6. Each case 1 and 6 is heated by live steam from pipes 14, that enter the ends of journals 8 through swivel joints and by branches 15 to the lower case 1. The opposite halves of the molds are mounted in the cases 1 and 6 by means of bolts passing through lugs of the corresponding halves of the molds. These molds are arranged to accurately register by means of an annular tongue and groove.

In operation, the cases with the molds in place being open and charged with live steam, a prepared unvulcanized tire is placed in the mold. The upper case 6 is then closed and locked to the lower case 1. A valve is then opened permitting live steam to enter the interior of the tire. In a short time, usually about three minutes, the tire, from the combined effect of external and internal heat, is completely vulcanized, when the valve is closed and a cock opened, the former shutting off the further entrance of live steam and the latter permitting the steam in the tire to escape. By hinging the cases together they are readily opened to permit the placing and removal of tires and to change the molds when desired without danger of burning the operator or waste of time. The counterweight 10 constantly overbalances the weight of the case 6, and hence by no accident can the two cases strike together and crush the hands of the operator.

This horizontal vulcanizer has been modified in several ways. Patents Nos. 1,588,668 and 1,632,394 have a lower mold element having a much deeper mold chamber than the upper mold element. The inner tube is first partially collapsed by means of a vacuum pump and placed in the lower mold. It is then entirely collapsed with the mold section. The tube is then connected to a source of carbon dioxide gas with which it is filled so as to expand it and cause it to engage the walls of the lower mold section. The upper mold section is then swung down and locked. By this procedure the tube is not injured during the locking operation. The entire mold is then tilted into an inclined position while the tube is being vulcanized so that the condensation in the mold chambers can be drained. When the tube is vulcanized the mold is brought into horizontal position and the tube is con-

nected to a vacuum line thus removing all the gas and collapsing it whereby it is easily removed from the mold. Patent No. 1,588,668 provides for the rapid inflation and deflation of the tube so that it can be worked loose from the mold and easily removed.

Both mold sections have also been arranged to swing apart as in patent No. 1,624,343 so as to release the tire quickly and enable it to be removed easily. Patent No. 1,590,377 uses two mold units having their respective sections swinging apart from each other and counterbalancing the opposite section of the other mold. In a recent patent No. 1,666,649 the mold sections not only swing apart but also swing as a unit from a horizontal position.



The Vertical Type

In the vertical watch case vulcanizer the mold sections are hinged to swing vertically. Each unit usually has a fixed member having hinged complementary mold sections on each side thus providing two separate cavities. One of the earliest patents No. 1,234,065 for this type of vulcanizer was granted in 1917 which will be described in detail. There is shown in the accompanying illustration a stationary hollow vulcanizing member 10 mounted upon a floor base 11. To each side of the stationary vulcanizing member there is a hinged vulcanizing member 12, hinged thereto by hinges 13 at the rear, as shown in Fig. 1-a, so that the hinged members can be swung laterally open or shut. Each vulcanizing member 10 and 12 is hollow and forms a steam chamber.

Steam is introduced into the stationary vulcanizing chamber through a steam pipe 14 which leads from a supply pipe 15. Steam is supplied to the hinged vulcanizing members through a pipe 16 which at one end is secured to the hinged member and at the other end is secured to a pipe 17 extending up from the supply pipe 15 and in vertical alinement with the hinge 13 above and so that the pipe 16 will turn on the pipe 17 when the hinged member 12 is moved open or shut. Hence, steam can enter any of those members at any tire and each is provided with a shut-off valve 18. The adjacent walls of the members 10 and 12 of the vulcanizer have annular recesses 20, each semi-circular in cross section, and arranged so that said recesses will register with each other when the vulcanizing members are closed, for receiving and holding the tire while being vulcanized.

After the tire has been formed by the workman on a core it is removed and carried to the vulcanizer. Then the mold ring 21 is placed within the tire and the tire and ring placed within the recess in the stationary vulcanizing member 10, and the hinged member 20 closed and locked tightly shut and held by the bolts 22 which are secured in the lugs 23 in the inner periphery of the stationary member 10 of the vulcanizer, as shown in Fig. 3, and project through the lugs 24 on the inner periphery of the hinged member 12 of the vulcanizer. When the nuts 25 are tightened on the bolts 22, the hinged vulcanizing member will be tightly secured to the stationary member 10 and will remain so during the vulcanizing.

The annular mold ring 21 is substantially V-shaped in cross section and engages, separates and holds in place in the vulcanizer the free edges and beaded portions of the tire as shown in Fig. 3. Steam is supplied to the interior of the tire through a pipe 30 and a tube 31, which extends through the vulcanizer and is connected by a double joint to the tubes 32. The tubes 32 extend to and are secured by releasable unions 33 to pipes adapted to extend through the ring 21. The pipes 34 are provided with valves 36, so that when the members are swung open, the valves are closed and the unions 33 are disconnected.

After two tires are placed in the vulcanizer, the steam is turned on through the various pipes, whereby the vulcanizing members 10 and 12 are heated and transmit heat inwardly to the tire, and steam is directly introduced into the tire for quickly and effectively heating the same and to maintain the interior thereof under strong pressure, say sixty-five pounds to the square inch. This will very effectively vulcanize the tire from both the inside and outside, force and expand the fabric therein outward and thus prevent or smooth out wrinkles and make a well vulcanized durable tire with a perfect external surface. To remove the tire, after it is vulcanized, the nuts 25 are taken off the bolts 22 and the union 33 separated whereupon the side members 12 are opened, the tire taken out of the vulcanizer and the mold ring 21 taken out of the tire.

Locking Mechanism

The later patents for this type of vulcanizer have developed quick acting locking means for the mold sections. The clumsy manipulation of bolts has been entirely eliminated. Patent No. 1,633,587 has swing bolts provided with cam shaped levers for locking the sections. In patent No. 1,583,226 a rotatable plate is used to lock the sections. In patent No. 1,575,025 manipulation of a hand wheel releases the locking means. Vulcanizers have been provided with a rotary locking ring mounted on one member of the vulcanizer, which

ring is provided with cam-shaped locking formation engaging similar formations on the other vulcanizer member, and locking rings have also been provided with breaking formations which are for the purpose of breaking the adhesion between the mold sections and thereby starting the molds.

In these vulcanizers, the ring has been provided with some means by which it could be rotated in one direction to lock and in the other direction to break and open the molds. With this form of device, however, the mold sections are merely started on the opening movement, and the operator is required to swing the heavy sections open to remove the cured tire or tube and replace with an unvulcanized article. In patent No. 1,658,376 means are provided for swinging the doors open automatically. The same device also closes the vulcanizer and locks it automatically.

Adjustable Vulcanizers

The mold sections in some watch case vulcanizers can be removed and replaced by others. A single unit can thus be used for different sizes of tires or tubes. In patent No. 1,558,096 lateral adjustable arms are provided to support the tire molds of different internal diameters.

Watch Case Retreaders

Several tire retreaders have been patented built on the watch case construction. The mold sections are arranged as in the usual watch case vulcanizer, as in patent No. 1,389,599. The molds may also be adjustable as in patent No. 1,392,487. British patent No. 212,565 provides for heating the tread without heating the other parts of the tire.

Abstracts of watchcase vulcanizer patents will be reviewed in the next issue.

Rubber Association of America Official Type Samples

The Crude Rubber Committee of the Rubber Association of America, Inc., has completed the preparation of its official series of rubber type samples. These are prepared in book form about 5 by 9 inches. Each book contains 10 pieces. All tenders of rubber must conform to the average quality of these samples which have been officially sealed by the association. Sets of these official samples have been sent to appropriate centers in the primary markets for guidance to suppliers in meeting the specifications of purchases and sets are on file in New York with the Rubber Exchange of New York and the Rubber Trade Association. Others are in London, Amsterdam, Colombo, Singapore, Penang and other rubber market centers.

The official type samples include four grades of ribbed smoked sheet, four of pale crepe (No. 1 and No. 2, thick and thin), two of brown crepe, and three of blanket grades designated as "B," "C," and "D." No. 1 brown crepe was known previously as light clean thin brown and No. 2 brown crepe as clean thin brown. The blanket grades were formerly known as amber Nos. 2, 3 and 4. The official type samples will cover all rubber trading with the exception of selected estates grades and roll brown.

Felt Under Rubber Flooring

More satisfactory service from rubber tiling or flooring, it is claimed, may be obtained by using an underlying sheet of fibrous material as wool felt which has its under surface impregnated with a waterproofing binder and its opposite face free from the binder. The felt is secured to the floor with a linoleum or other waterproof cement. **T. J. Mell,** U. S. Patent No. 1,655,872, Jan. 2, 1928.

Renascence of Synthetic Rubber

Patents registered in England by I. G. Farbenindustrie, A. G. Frankfort-on-Main, revive interest in artificial rubber

Further interest in research in synthetic rubber has been aroused by the registration of two German patents in England—British Patents No. 283,840 of January 14, 1927, and No. 283,841 of January 15, 1927—a general description of which follows.

Hydrocarbons suitable for the manufacture of synthetic rubber, such as butadiene, isoprene and dimethylbutadiene, are emulsified and are then polymerized in the presence of oxygen or of substances yielding oxygen. The medium in which the emulsion is prepared may be an inert substantially aqueous liquid or solution or a water-containing viscous liquid and in this connection reference is made to solutions of soap, albuminous substances, salts of sulphonated fatty acids and of alkyl sulphonic acids and saponin and also to aqueous suspensions of oils.

For accelerating the polymerization, it is preferred to employ an alkaline oxygen-yielding substance, such as sodium perborate, potassium percarbonate or barium peroxide, but other oxygen-yielding substances also may be used with the addition, it may be, of a small amount of alkali. In one example, a mixture of isoprene and dimethylbutadiene is emulsified in water containing egg albumen and soap and polymerization is effected in the presence of gaseous oxygen. In another example, sodium perborate is added to a mixture of isoprene, water and sodium or potassium oleate and the mixture is emulsified in the presence of air. Polymerization is then effected at 60-70 degrees C. In a further example, an emulsion of isoprene and butadiene in an aqueous solution of sodium isobutylnaphthalene sulphonate is treated with potassium percarbonate, whereafter the hydrocarbons are polymerized.

In the second patent it is claimed that the hydrocarbons are polymerized by treatment with an alkali metal, such as sodium or potassium, in an atmosphere of hydrogen, nitrogen or carbon dioxide and in the presence of an organic hydroxy compound or ether; the quantity of organic hydroxy compound employed should not be sufficient to react with all the alkali metal present. It is preferred to use an organic hydroxy compound or ether of high molecular weight, such as starch, cellulose, a cellulose ether or superficially oxidized rubber. The reaction mixture may include an inorganic hydroxy compound, the presence of which in the mixture may be ensured by using superficially oxidized sodium or by treating the hydrocarbon in a moist state. The reaction mixture may include also an inert solvent, such as hydrocarbon, which may be removed from the product to any desired extent. The polymerization may be effected in the cold or at a raised temperature and the mass may be in motion or at rest.

According to the examples: (1) isoprene, glycerine and sodium wire are agitated together at 60 degrees C. in an atmosphere of carbon dioxide until a polymerized product is obtained; (2) dried isoprene is mixed with starch and sodium and the mixture is treated as in example (1); (3) isoprene previously saturated with hydrogen is mixed with ethyl cellulose and superficially oxidized sodium and is polymerized at 40-50 degrees C. in an atmosphere of hydrogen; (4) imperfectly dried isoprene containing isoprene alcohol as an impurity is treated with sodium, solid caustic soda and benzene and, after the mixture has been saturated with carbon dioxide, is polymerized at 60-70 degrees C. in an atmosphere of carbon dioxide.

EDITORIALS

Greeting the Rubber Institute

GRATIFYING to every branch of the rubber industry is the announcement that foreward-looking leaders are at last translating into reality the long-cherished dream of a Rubber Institute. For years many had contended that the industry had grown up sufficiently to warrant the establishment of some such balance wheel for its business conduct, but they had found it hard to persuade others that the need was urgent and the possible advantages considerable. They had instanced the steel industry as a conspicuous exemplar in this respect. It had undergone experiences quite as erratic, wasteful, and vexatious as the rubber industry. Even in its most gloomy periods, however, its astute captains did not despair of bringing order out of chaos, but they had to success had ignored their counsel sought their aid when bide their time. Finally even those who in the flush of bitter trade wars threatened their ruin, and a practical plan was evolved for real cooperation with rational competition. The success of the steel institute plan in stabilizing the industry is now familiar history.

The reverses suffered by many rubber manufacturers in the past have made them realize the need of a get-together scheme that might not only effectively forestall disastrous competitive conflicts, but would rid the industry of many wasteful and mischievous practices and pave the way for fair and steady profits. At any rate it is comforting to every well-wisher of the industry to note that those who did not fare ill are just as eager as those who endured setbacks to place the industry on a sounder economic basis; and that enthusiasm over the plan is shown as much by the largest as the smallest rubber companies. In such faith and accord lies assurance of success.

Fortunate, also, is the institute in its selection of General Lincoln C. Andrews as its director general. A commander in two wars, the recipient of a distinguished service medal and two congressional citations, the author of several important works on military operations, former chief executive of the New York Transit Commission, receiver of the New York & Queens County Railway Co., and assistant secretary of the United States Treasury, General Andrews brings to the new office not only high character but broad experience and uncommon administrative ability. In short, the institute is being launched under very auspicious conditions.

* * *

The Rebirth of Guayule

THE Silver Pallas (*Parthenium argentatum*), or guayule as it is better known, may yet well merit its classic title by helping in no small measure to safeguard the American rubber industry should its basic supply be again endangered through foreign forces. Already the remarkable improvement in the quality of its product during the past two years is conceded to be one of the most important developments in the history of rubber; while the progress made in effecting the evolution of a rubber-bearing shrub from one of low to one of high content that has remained true to type through numerous plant generations, thriving even better in intensive and commercial cultivation than in its ancestral habitat, is one of the wonder stories of botanical and chemical research as well as of industrial enterprise. Scarcely less significant in supplementing the other advances is the ingenious means devised for mechanizing the large scale growing and harvesting of the new and better guayule.

Thus does the Cinderella of the rubber industry, long derided as a substitute and ill compared with its proud sisters, bid fair to become indeed a fairy princess. Guayule is at last coming into its own; and America is assured of a considerable increase in its rubber supply and a new and extensive industry virtually made certain.

Merging vs. Anti-Trust Laws

EVEN though they have done much to standardize methods and output and have effected many economies in production, many small and medium-sized rubber manufacturing concerns are still sorely troubled about maintaining themselves in the face of mass production and distribution by stronger competitors. To save their businesses from possible ruin many see practically no recourse but consolidation. But the salvation of a worthy industry apparently means little to some official and other groups. They have carefully intimated that if any mergers be attempted, even though they benefit not merely several employers but thousands of employes, federal anti-trust laws will be promptly invoked to check any plans of combination.

The unreasonableness of the veiled threat is emphasized by the plainly tolerant attitude of the government toward many vast and growing industries, some even in the billion-dollar class, and whose enormous proportions have been attained through combinations quite as much as through production and distribution economies. Still their violation, or at least circumvention, of anti-trust laws rouses no official criticism. However, the warning given may be only a timely political gesture. Great parties might well fear the effect on their fortunes at this time of a reopening of such a vexatious question.

American Rubber Technologists

THE INDIA RUBBER WORLD'S *brief biographies of American rubber technologists are valued by our readers because they record the accomplishments of the men in charge of the research, development and control work of the rubber manufacturing industry.*

Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication.

JESSE H. MASON, chem. *b.* July 30, 1887, Beverly, Mass.; B. S., U. of Maine; chem., Gen. Electric Co., Syracuse, N. Y., 1909-1911; chf. chem., Plymouth Rubber Co., Canton, Mass., 1911-1917; supt., Stamford Rubber Supply Co., Stamford, Conn., 1917-1919; fact'y. mgr., Duratex Co., Newark, N. J., 1919-1922; genl. mgr., Vulcan Proofing Co., Brooklyn, N. Y., 1922-1926; treas. and genl. mgr., Haartz-Mason Rubber Mfg. Co., Watertown, Mass. *Member:* Sigma Chi, Masons. *Address:* 270 Pleasant St., Watertown, Mass.

Henry F. Klemm, chem. engr. *b.* Feb. 2, 1896, Chicago, Ill.; Lane Tech. High School; B. S., Armour Inst. Tech., 1920; LaSalle Extension U.; chem. lab., Newport Chemical Co., Carrolville, Wis., and The Amer. Coconut Butter Co., Chicago, Ill., both in 1920; rubber chem., Underwirters Labs., Chicago, Ill., since 1920. *Member:* Masons. *Address:* Underwriters' Laboratories, 207 E. Ohio St., Chicago, Ill.

Arthur Greenbaum, chem. engr. *b.* Boston, Mass.; B. S., Tufts Coll., 1915; lab. asst., Boston Woven H. & R. Co., 1915-1916; chf. chem., Plymouth Rubber Co., Canton, Mass., and gas mask expert, Chem. Warfare Service, 1916-1918; chf. chem. and compounder, Essex Rubber Co., Trenton, N. J., 1918-1921; chf. chem., Panther Rubber Co., Stoughton, Mass., 1921-1923; supt., Panco Rubber Co., Chelsea, Mass., since 1923. *Member:* Masons, Stoughton Chamber of Commerce. *Address:* 73 Crescent Ave., Beachmont, Mass.

Frank E. Harris, chem. *b.* 1894, Dorchester, Mass.; Boston High School of Commerce; B. S., M. I. T., 1917; lab. asst., Boston Belting Co., Boston, Mass., 1912-1917; lab. asst., Plymouth Rubber Co., Canton, Mass., 1919-1921; chf. chem., Appleton Rubber Co., Franklin, Mass., 1921-1924; chf. chem., Plymouth Rubber Co., 1924-1928. *Member:* Elks, Mitchvia Club, A. S. T. M. *Address:* 14 Cottage St., Sharon, Mass.

Frederick R. Kaimer, chem. engr. *b.* Sept. 27, 1901, New Haven, Conn.; B. S., Sheffield Sci. Sch., Yale U., 1924; chem. engr., wire and cable div., Gen. Electric Co., Bridgeport, Conn., since 1924. *Author:* "Micoscopy of Fillers for Insulation Compounds," in preparation; patent on welding electrode. *Member:* Alpha Sigma Phi, Alpha Chi Sigma, Am. Chem. Soc. *Address:* 806 Boston Ave., Bridgeport, Conn.

Albert G. Emery, chem. engr. *b.* July 6, 1885, Boston, Mass.; S. B., Harvard U., 1909; research asso., Carnegie Inst., Wash., D. C., 1909-1912; chem. engr., India Rubber Co., New Brunswick, N. J., 1912-1913; U. S. Rubber Co., gen'l. lab., New York, N. Y., 1913-1918; chem. and devel. engr., footwear div., U. S. Rubber Co., New Haven, Conn., since 1918. *Address:* P. O. Box 606, New Haven, Conn.

Leo I. First, *b.* May 28, 1900, Dorchester, Mass., Hawley engr. sch., Boston U. and Y. M. C. A. courses, Boston, Mass.; mfg. depts., 1914-1926; office mgr. and asst. to pres., Boston Insulated Wire Co., since 1926; pres., Globe Insulated Wire Co., Wollaston, Mass., since 1926. *Address:* 414 Talbot St., Dorchester, Mass.

Watson G. Harding, chem. *b.* 1896, Saranac Lake, N. Y.; A. B., Cornell U., 1917; devel. dept. and gen. labs., B. F. Goodrich Co., 1917-1920; chf. chem., 1920

Canadian Group

William G. Nelson, chem. *b.* Nov. 6, 1888, Ottawa, Kan.; B. S. Ottawa U., 1911; post grad. student, U. of Kan., 1912; head of science dept., Hutchinson High School, Hutchinson, Kan., 1912-1914; chem., Morgan & Wright, Detroit, Mich, since 1915; now chf. chem. and tech. supervisor. *Member:* Inter-Collegiate Athletic Club, Mason, Laymens International Club, Y. M. C. A. Leader Club, Am. Asso. for Adv. of Sci.; Nat'l Geog. Soc., Am. Chem. Soc. *Address:* 166 Philip Ave., Detroit, Mich.

H. Ralph Leary, supt. *b.* Sept. 18, 1894, Fall River, Mass.; grad. pub. schools, Hudson, Mass; mill and laboratory, Apsley Rubber Co., 1915-1920; tire maker, Fisk Rubber Co., Chicopee Falls, Mass., 1920; supt., Hydro-United Tire Co., Pottstown, Pa., 1920-1922; supt. mill and calender depts., Murray Rubber Co., Trenton, N. J., 1922-1927; genl. supt. and purchasing agt., Quebec Rubber Co., Quebec, Can., since 1928. *Address:* Quebec Rubber Co., Quebec, Can.

Jean Thomas Beaudry, chem. *b.* Sept. 4, 1894, Montreal, Que.; B. S., Montreal Coll., Laval U., 1914; lab., Canadian Analine Co., Montreal, 1915-1917; lab., Phenarsenyl Co., Montreal, 1917-1918; lab., Abitibi Power & Paper Co., 1918; compdg. and test'y. dept., Dominion Rubber Co., Ltd., Montreal, since 1918. *Address:* 275 Outremont Ave., Montreal.

William E. Campbell, chem. engr. *b.* 1885, Dutton, Elgin Co., Ontario, Can.; chem. engr., Queens U., Kingston, Can., 1908; chem., 1908-1910; chf. chem. since 1910, Gutta Percha & Rubber, Ltd., Toronto, Can. *Author:* "Rubber Belting and Methods of Tests." *Member:* A. S. T. M., Am. Chem. Soc., chairman Committee on Standardization of Belting and Hose Fabrics of Rubber Asso. of Canada. *Address:* 130 O'Hara Ave., Toronto, Can.

1923; asst, supt., 1923-1926, Whitall Tatum Co. Keyport, N. J.; facty. mgr., Lubron Co., Everett, Mass., 1926; hard rubber plant, U. S. Rubber Co., Providence, R. I., since 1927. *Member:* Delta Tau Delta, Cornell Club of New York. *Address:* 339 Morris Ave., Providence, R. I.

Edward O. Denzler, chem. *b.* 1889, Rockville, Conn.; Phila. Coll. Sci., 1911; lab., Arbuckle Sugar Ref., Brooklyn, N. Y., 1912-1913; lab., Standard Oil Co. of N. Y., 1914-1916; assay lab., Handy & Harmon, 1916-1917; Chem., War Service, transferred to Bureau of Mines, Cornell U., 1917-1919; chf. chem. and asst. supt., Seamless Rubber Co., since 1920. *Member:* Am. Chem. Soc., Masons, New Haven Republican Club. *Address:* 96 Filbert St., Spring Glen, New Haven, Conn.

Frederick Henry Martin, chem. *b.* York Village, Maine; A. B., Bates Coll., 1910; A. M., Princeton U., 1915; Ph.D., Princeton U., 1916; prof. chem., Hillsdale Coll., 1912-1913; instructor chem., Princeton U., 1913-1915; fellow chem., Princeton U., 1915-1916; research chem., 1916-1918; devel. dept., footwear div., 1918-1922; asst. supt., footwear div., B. F. Goodrich Co., Akron, O., since 1922. *Author:* Numerous patents on footwear construction, including Zipper overshoe. *Member:* Amer. Chem. Soc., Franklin Club, Eskimo Club. *Address:* The B. F. Goodrich Co., Akron, O.

Burton M. Fairbank, chem. *b.* 1900, Naugatuck, Conn.; S. B., Sheffield Sci. Sch., Yale U., 1921; asst. chem. and chem. since 1926, Beacon Falls Rubber Shoe Co., Beacon Falls, Conn. *Member:* Red Men, Masons. *Address:* 223 N. Main St., Naugatuck, Conn.

Max N. Nickowitz, chem. *b.* Dec. 12, 1896, Newburgh, N. Y.; Newburgh Academy, N. Y.; State Coll., Union U., 1919; chem., Fabrikoid plant, E. I. du Pont de Nemours & Co., Newburgh, 1919-1921; acting county chem., Orange and Ulster counties, 1921-1922; chf. chem., 1923-1925, and tech. supt. since 1925, Rubber Products Plant, E. I. du Pont de Nemours & Co., Fairfield, Conn. *Author:* Articles on automobile fabrics; methods of testing coated textiles; patents for finishing rubber coated fabrics. *Member:* Kappa Nu, Am. Chem. Soc. *Address:* E. I. du Pont de Nemours & Co., Fairfield, Conn.

Charles Lewis Foutz, engr. *b.* July 10, 1889, Greenville, O.; U. S. Naval Academy, Annapolis, Md., 1913; U. S. Navy, 1913-1915; Gunn Richards & Co., engineers and accountants, 1915-1917; U. S. Navy, 1917-1919; prod. dept., U. S. Rubber Co., New York, 1919-1921; prod. dept., Morgan & Wright, Detroit, Mich., 1921-1923; asst. facty. mgr., G. & J. plant, Indianapolis, Ind., 1923-1925; fact'y. mgr., Omo Mfg. Co., Middletown, Conn., since 1923. *Member:* Masons, Army & Navy Club, Washington, D. C. *Address:* Omo Mfg. Co., Middletown, Conn.

What the Rubber Chemists Are Doing

Direct Determination of Rubber[1]

A. R. Kemp, W. S. Bishop, and T. J. Lackner

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THE method below for the direct determination of rubber in soft vulcanized rubber and the sample analytical results obtained are condensed from the author's paper.

Outline of Method

Briefly, the method consists in extraction with acetone of resins, free sulphur, oils, waxes, organic accelerators, age resistors, part of the mineral rubber, etc., followed by further removal of a portion of the mineral rubber with chloroform. A sample of the extracted residue is then dissolved in tetra-chloroethane and the hydrocarbon present in the unsaturated state determined by the modified Wijs method.[2]

In order to determine the amount of hydrocarbon saturated with sulphur, a direct determination of sulphur combined with rubber is made on another portion of the extracted sample. The sum of the hydrocarbons in the unsaturated and combined states is then used to calculate the rubber content of the original sample as follows:

$$\text{Per cent hydrocarbon in original sample} = \frac{\left(\frac{100\,A}{372.8} + 2.13\,B\right)(100 - C)}{100}$$

A = iodine value of acetone- and chloroform-extracted residue.
B = Per cent sulphur combined with rubber in acetone- and chloroform-extracted residue.
C = percentage of acetone and chloroform extracts.

Experimental Procedure

The acetone and chloroform extractions are carried out on 2-gram samples according to standard procedure. The chloroform is removed by heating in a vacuum oven at 70 degrees C. to constant weight. An alcoholic alkali extraction is also conducted on one of the extracted samples to detect the presence of factice, for which, if present, correction is made later. The mineral rubber added was extracted by the acetone and chloroform. In general, the effect of ordinary amounts of mineral rubber is small, though perhaps not entirely negligible in extreme cases.

In analyzing rubber compounds containing factice, it would seem at first that the analyses should be carried out on the alcoholic potash-extracted sample. It has been found, however, that in most cases this treatment, even after thorough removal of moisture and free alkali, changes the rubber to a condition such that it is insoluble in the tetrachloroethane. Furthermore, the alcoholic alkali extraction process removes only about 60 per cent of the factice added. When the alcoholic potash extract exceeds 1 per cent, indicating the presence of factice, the rubber hydrocarbon content is calculated in accordance with the formula already given, except that the value of C for total extracts should include the alcoholic potash extract.

Analysis of Reclaimed Rubber

As reclaimed rubber is present in many commercial rubber compositions, the estimation of its rubber content is a matter of importance. Since a portion of the rubber in uncured reclaims is removed by chloroform extraction, it is necessary either to omit this process or to cure the reclaim previous to analysis. Tables 1, 2, and 3 give the results of analyses of four commercial reclaims by the manufacturers' shortened difference methods, standard difference method, and the proposed direct method, respectively. The results in Table 1 are evidently not corrected for carbon black or cellulose, both of which are present. Unextracted mineral rubber and decomposable inorganic compounding ingredients also would tend to make the rubber content high in this method. The sulphur remaining in the ash, however, would reduce the rubber content, thus compensating in part for the other additive errors.

Table 1

ANALYSES OF RECLAIMS BY MANUFACTURERS' SHORTENED DIFFERENCE METHODS

	Boot and Shoe	Black Tire	Mixtures—Boot and Shoe and Tire	
	I Per Cent	II Per Cent	III Per Cent	IV Per Cent
Acetone extract (unvulc.)	10.8	11.5	10.0	13.0
Chloroform extract (vulc.)	....	....	....	....
Alcoholic potash extract	0.65	0.49	....	....
Total sulphur (unvulc.)	5.75	2.51	3.50	3.50
Ash (unvulc.)	47.7	25.4	25.0	24.0
Total	64.9	39.9	38.5	40.5
Rubber by difference (unvulc.)	35.1	60.1	61.5	59.5

These analyses were furnished by the manufacturers of the products. The samples were cured with 2 per cent sulphur preparatory to analysis, according to information furnished.

Table 2

AVERAGE ANALYSES OF RECLAIMS* BY THE STANDARD DIFFERENCE METHOD

	I	II	III	IV
Organic acetone extract (vulc.)	10.73	10.65	10.31	12.40
Chloroform extract (vulc.)	1.62	1.55	1.57	1.67
Alcoholic potash extract (vulc.)	0.65	0.49	0.50	0.50
Total sulphur (net) (vulc.)	6.27	5.03	4.50	4.62
Ash (vulc.)	44.7	30.7	25.7	26.8
Carbon (vulc.)	2.54	5.49	2.13	1.81
Cellulose (vulc.)	4.51	1.47	1.48	3.96
Total (vulc.)	71.02	55.38	46.19	51.76
Rubber hydrocarbon by difference:				
Vulcanized	28.98	44.62	53.81	48.24
Unvulcanized	29.9	46.0	55.5	49.8

*Reclaims were cured with 3 per cent sulphur before analyzing to render insoluble in chloroform that portion of the rubber which had been rendered soluble by the reclaiming process. Results corrected for cellulose and carbon.

Table 3

AVERAGE ANALYSES OF RECLAIMS BY THE PROPOSED METHOD*

	I	II	III	IV
Acetone extract	11.13	12.69	11.52	13.30
Iodine value of acetone extracted residue	106.4	173.0	206.5	185.3
Sulphur combined with rubber in acetone extracted residue	1.09	2.39	2.75	2.51
Rubber hydrocarbon found	27.4	45.0	54.2	47.7

*Samples unvulcanized and chloroform extraction omitted.

[1] *Ind. & Eng. Chem.*, April, 1928, 427-431.

[2] Kemp, *Ind. Eng. Chem.*, 19, 531 (1927). Also, Fisher, India Rubber World, 76, 78 (1927).

Aging of Stretched Rubber[1]

Arthur Kelly, Bert S. Taylor, and Webster N. Jones.

The B. F. Goodrich Co., Akron, O.

THE following succession of extracts from this important investigation on the aging of rubber outlines the methods employed and results obtained.

The function of an accelerated aging test is to approximate quickly the ability of stocks to withstand deterioration during storage and service. The Geer oven and the Bierer-Davis bomb methods of accelerated aging are carried out on tensile strips which are not subjected to stresses. A large number of rubber

[1] Presented before the Division of Rubber Chemistry at the 74th Meeting of the Amer. Chem. Soc., Detroit, Mich., September 5 to 10, 1927.

articles are, by virtue of their use, and sometimes under conditions of storage, subjected to stress. For some time investigations have been in progress on the effect of aging of stretched rubber in order to distinguish between the relative merits of various compounds which are subjected to stress during service. Since an article is made of rubber in order that it will have flexibility and permit deformation, some measure should be made of the relative deterioration of compounds under stress. Data have been collected in an endeavor to correlate aging in sunlight with other accelerated aging tests on both unstretched and stretched samples. No direct relationship has been found between the aging in sunlight and the other methods, but a number of interesting facts have been discovered.

Sunlight Aging Tests

The first step in sunlight aging of stretched rubber was to expose for several weeks during the summer months four compounds initially stretched to different degrees, periodically measuring the tensile strength of test strips. Obviously, the stress on the exposed samples became less as the stock took a permanent set under stretch. For this study a tread stock, a tube stock, a shoe upper, and a golf ball thread rubber were used. The data on tread stock and shoe upper stock are included in this report. In general, it was found that during the first few weeks deterioration was more rapid at low elongation than at high elongation. There was a reversal of this condition during the last weeks of the test; that is, the high elongations showed the greatest deterioration. This is probably due to the fact that when the samples under greater tension began to crack the cracks opened wide, exposing fresh surfaces to bright light, whereas the cracks in samples under weak tension were not pulled wide open and the fresh surfaces at the bottom of the cracks were shadowed from direct sunlight. The more severe cracking at low elongations during the early weeks of exposure was striking and the order of intensity as determined by visual inspection was confirmed by the tensile results. This was the principal result of the first set of experiments.

Comparison of Sunlight with Geer and Bierer Aging Tests

The next step on a larger scale was a comparison of stretched and unstretched rubber in sunlight with the same compounds aged unstretched in the Geer oven and in the Bierer bomb. Several classes of compounds were treated by these methods, special emphasis being placed on the testing of treads and tubes. Here the general facts were found to be the same as in the first series of experiments. As the cracks deepen the measured thickness of the strips is greater than the actual thickness of the uncracked rubber and the tensile strength in kilograms per square centimeter is apparently less than it is actually. The tensile results based on the overall thickness of the test strips, however, give a fairly accurate measure of the intensity of the cracking. The results were consistent with visual comparisons in each series of tests.

Other Types of Aging Tests

The lack of significant data from the comparison of the aging of stretched rubber in sunlight with accelerated aging of unstretched samples in the dark suggested the examination of stretched rubber in other types of aging tests. One compound only was tested. This was a rubber-sulphur-accelerator mix in order to study the effect on a compound in which rubber was the principal ingredient. The strips, about 1/32 inch (0.8 mm.) thick, were stretched 0, 50, 100, 200, 300, and 400 per cent. The stretched samples were placed in sunlight, in ultra-violet light (temperature 38 to 40 degrees C.), and in a Geer aging oven at 70 degrees C. The source of ultra-violet light was a quartz mercury arc placed 15 inches (38 cm.) from the samples. Samples from all methods were tested after three and six days' exposure. Extended cracking over the surface occurred in both the sunlight and ultra-violet light tests. In the Geer oven, however, the cracks were localized along the edges of the test strips. The minimum stretch used in these tests is greater than that corresponding to maximum cracking in sunlight aging. Further work must be done, therefore, to ascertain whether deterioration takes place at a maximum rate in oven, bomb, and ultra-violet light at a definite percentage of stretch.

Sunlight aging is not satisfactory for quantitative work because the light intensity is never constant and the temperature and humidity of outside air vary. However, comparative tests against compounds of known quality are valuable if a compound is to be used outdoors. Often a compound which ages well in the oven and bomb tests will age poorly in sunlight. For other compounds the reverse is true.

Summary

1. Sunlight aging under tension of many compounds including the following has been investigated: Tire tread, shoe upper, tube stocks, golf ball thread, jar rubber, solid tire, bathing cap stock, channel rubber.

2. With some of these stocks the sunlight aging has been compared with unstretched samples by Geer oven, Bierer bomb, and ultra-violet light methods.

3. The stretching of the test strips accelerates deterioration in sunlight, ultra-violet light, and Geer oven. Stretched samples have not yet been tested in the Bierer bomb.

4. The rate of deterioration was not proportional to the degree of stretch in any of the stocks in the early stages of exposure. In sunlight there is a critical elongation for each stock at which the deterioration progresses more rapidly than at any other in the early stages of aging.

5. No direct relationship was found between the results of sunlight aging and the other methods employed.

6. Stretched strips aged in ultra-violet light were found to give softer stress-strain curves than the unaged samples, whereas sunlight aging under the same conditions stiffens the stress-strain curve.

Fatty Acids on Vulcanization[1]

G. Stafford Whitby and B. A. Evans.

THE important influence of free fatty acids on the vulcanization of rubber is indicated by the following section from the original paper.

Experiments with hexamethylenetetramine showed that addition of fatty acid beyond that (about 0.1 per cent) in the extracted rubber used had some effect, albeit a relatively small effect, in advancing the cure both in the presence of 5 and of 15 parts of zinc oxide, the effect of 3 parts of acid being somewhat greater than that of 1 part. In the case of diphenylguanidine, results of Sebrell and Vogt on the one hand and of Martin and Davey on the other, although differing in some respects, agree in showing that fatty acids, while hastening the cure in the presence of certain small proportions of zinc oxide, actually retard it in the presence of certain larger proportions. Thus Sebrell and Vogt found that in the stock consisting of rubber 100, sulphur 4, diphenylguanidine 0.5, curing was much hastened in the presence of 1 part and retarded in the presence of 5 parts of zinc oxide by the acid naturally present in rubber. In the stock rubber 90, sulphur 5, diphenylguanidine 1, Martin and Davey found that 3 parts of oleic acid retarded the cure with 1 part of zinc oxide, accelerated it with 5 parts, and retarded it with 10 or 20 parts.

The influence of organic acids on the activity of organic accelerators in the presence of various proportions of zinc oxide has not yet been studied extensively enough to allow of generalizations being laid down with any degree of finality, but it may be said that the data just reviewed show the statement of Martin and Davey to be invalid, and favor rather the generalization of Sebrell and Vogt that "accelerators requiring zinc oxide for activation require that it be in soluble form before any activation

[1] *J. Soc. of Chem. Ind.*, May 4, 1928, 122T-126T.

takes place." It would appear that in the case of accelerators, such as hexamethylenetetramine and diphenylguanidine, which are capable of producing good cures in the absence of zinc oxide, acids are comparatively unimportant, whereas in the case of accelerators, such as mercaptobenzthiazole and dithiocarbamates, which function only poorly in the absence of zinc oxide, the presence of fatty acids is important or essential.

It was found by Martin and Davey that in stocks consisting of rubber 90, zinc oxide 90, hexamethylenetetramine 1, the addition of 3 parts of oleic acid markedly reduced the "slope" of the load-strain curve. A similar but smaller effect on the part of fatty acid was observed in some of the stocks studied in the present investigation. Such an effect, presumably due to the influence of zinc soaps on the interfacial tension between the zinc oxide and the rubber, is probably incidental only, and the main effect of the zinc soaps is to be sought elsewhere (as in the formation of a zinc salt of the accelerator) in cases, such as mercaptobenzthiazole, where the promoting effect of the acid is high.

A comparison of the effectiveness in assisting vulcanization with mercaptobenzthiazole of the three fatty acids which occur naturally in rubber, viz., stearic, oleic, and linoleic acids, showed that the order just given represents the order of diminishing effectiveness. The reason for the somewhat lower effectiveness of the unsaturated acids as compared with stearic acid is probably that they combine with a part of the sulphur and thus reduce its active mass.

Action of Light on Dyed Fabrics

Light has two different effects on dyed fabrics—the color of the material fades or changes hue, and the material itself loses strength. The importance of these changes has been heightened in recent years by two new circumstances—the application of the vat colors of the Indanthrene series in the dyeing of materials, and the use of rayon in the production of fabrics required to withstand prolonged exposure to sunlight. The first of these conditions has raised the standard of fastness to light of dyed fabrics greatly, and has necessitated greater resistance of the textile material to the destructive action of the sun. The second factor consists in the use of a material which is much more susceptible to tendering under the influence of light than are the usual textile fibers.

Many theories to explain the fading action of light, based on both chemical and physical properties, have been advanced, but as yet very little is actually known. When dyed fabric fades in light there are at least four factors which produce or influence the fading—the dyestuff, the textile material, the light and the atmosphere surrounding the material. Additional complications may be introduced by the use of weighting or finishing material in the cloth. Two theories have been advanced to explain the fading action of light. The "oxidation theory" assumes that the dyestuff is destroyed, directly or indirectly, by the oxygen of the air. The second theory explains the destruction of the dyestuff by the reverse process—that is, the "reduction" of the dyestuff. This "reduction" means the abstraction of oxygen, or the addition ultimately of hydrogen, the dyestuff being in either case converted into colorless or lighter colored substances.

In experiments to isolate and identify the actual products of fading, a pure crystalline substance that proved to be isatin, was obtained. Isatin is an oxidation product of indigo, so that this is proof that the fading of indigo dyed cotton is a result of oxidation. Other experiments give some evidence that in the case of simple azo dyes fading is also due to oxidation.

In studying the loss of strength due to the action of light, experiments show that the effect is more marked with some colors, such as orange and yellow than in the blues and violets.

In the case of the tendering of rayon there seems to be little doubt but that the immediate cause is oxidation of the cellulose as the formation of "oxy-cellulose" can be shown by the usual tests.

Rubber Division Meeting A. C. S.

The Seventy-sixth meeting of the American Chemical Society will be held at Swampscott, Mass., September 10 to 14. The committee in charge of the local arrangements for the Rubber Division at Swampscott consists of J. M. Bierer, chairman; C. R. Boggs and T. M. Knowland.

The Organic Cellulose, Rubber and Leather and Gelatin Divisions will join in a symposium on "Polymerization," Tuesday afternoon, September 11. The tentative program is as follows: G. S. Whitby, "The Polymerization of Hydrocarbon"; Harold Hibbert, "Polymerization, Association and Aggregation"; George L. Clark, "Evidences of Polymerization by X-Ray Diffraction"; S. E. Sheppard, A. H. Nietz and R. L. Keenan, "Supermolecular State of Polymerized Substances in Relation to Thin Films and Interfaces."

Plans are being made for a joint meeting with the Colloid Division on Wednesday morning, September 12, at which time Dr. E. A. Hauser will present a paper. The Rubber Division will then have its regular sessions Wednesday afternoon, and Thursday.

Anti-Oxidants in Tires

The ravages of premature age in the destruction of everything made of soft rubber has been a problem with which chemists have labored for many years. Checking and cracking of rubber surfaces are chiefly due to oxidation and the chemical action of light and air which slowly destroys rubber. The discovery of anti-oxidants, applied in compounding, put to rout this ancient enemy of rubber, and tires are now comparatively free of deterioration even though they ride idle for indefinite periods. Oxidation of rubber is partly explained as a slow continuation of vulcanization after the tire has been finished.

Rubber technologists have determined just what heat and period of vulcanization produces the scientifically correct tire cure. Vulcanization in excess of that cure is disadvantageous to rubber aging quality.

Cracking or checking is not the only evil that the new process has eliminated for anti-oxidant ingredients add to the wearing qualities of rubber by improving its physical properties wherever used. Thus, anti-oxidants add to the wearing quality of the rubber used between plies of fabric, in cushion gum, tread and sidewalls. Inner tubes in which the compound contains anti-oxidants possess wear resisting qualities far in excess of tubes without them.

In view of the fact that the new de luxe six-ply balloon tires for high speed passenger cars are being built to hold up under mileage as great as that of the average passenger car, the cushion gum, tube stock and tread stock are all compounded with anti-oxidants. Since heat generated by internal friction at high speeds is one of the factors that contributes to premature aging of rubber, the use of anti-oxidants is given the credit, in a great measure, for the heat resisting qualities of the new tires. The rest is due to the heavier gages of friction and cushion stocks used. Thus tensile strength is increased more than 100 per cent over a few years ago and with anti-oxidants to forestall premature age it appears that the perfect tire is virtually here.—*Miller News Service.*

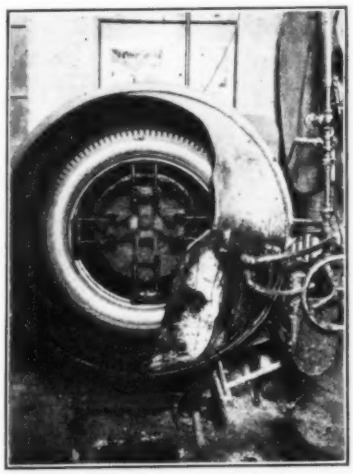
Subox

Subox is a new anti-corrosive material in the form of a paint effective for protecting the interior of vulcanizers and steel structures generally from the destructive action of sulphur gases or other corrosive influences. It is based on a pigment of suboxide of lead which by an electro-chemical process is produced in such a high degree of dispersion as to be mainly colloidal. After application, metallic lead is disengaged and a lead coating is gradually formed as a dense mass upon the surface. This coating is extremely resistant to the elements and corrosive fumes.

New Machines and Appliances

Tire Painting Machine

BLACK finished tires are generally preferred by makers, dealers and users of automobile tires. The methods and devices used for thus finishing a tire are many and various. The accompanying picture, however, represents a new and efficient machine for this purpose which is rapidly finding favor with tire manufacturers and dealers.



Utility Tire Painter

The device has an air actuated chuck that holds the tire by the beads and slowly revolves it while three special heads deposit the black solution on every portion of the tread.

One operator can do five or more tires a minute. A short travel of the wet tires by conveyer away from the painting machine serves to thoroughly dry them ready for wrapping and shipping. Utility Mfg. Co., Cudahy, Wis.

Press Work Time Signal

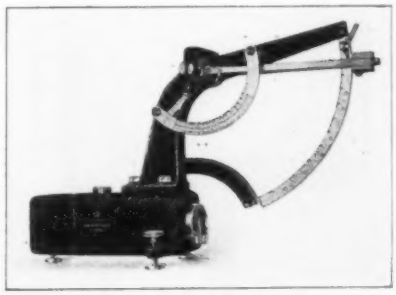
A DECIDEDLY convenient time signal for the pressman and tire vulcanizer is here depicted. It can be set to signal at any time the work is to be taken from the molds and leaves the pressman free to attend to his other duties. When the time is up the bell rings about 12 seconds. The clock may be set every 5 minutes for the full hour if desired. After the bell rings the setting pin automatically discharges and the clock will not again signal at that point until reset there.

Automatic Signal Clock

In the picture the setting pins are shown projecting from the case of the clock around its circumference. In operating the instrument always figure ahead of hand. For example, if the hand is at 12 and you want three-quarters of an hour cure on a casing, push in pin at No. 9 and mark No. 9 on all jobs to be removed from the molds. If another tire is put in the molds and the hand is at 2 and the job comes off in half an hour, push pin at No. 8. When the half hour is up the bell will ring and discharge the pin, and so on. Never try to force the pin out by hand. It will automatically release as clock hand reaches the figure on the dial. Lee Phelps, Ionia, Mich.

Rubber Resiliency Tester

IT is frequently desirable to test the resiliency of soft rubber articles especially those used as springs or to withstand rapid shocks in service.

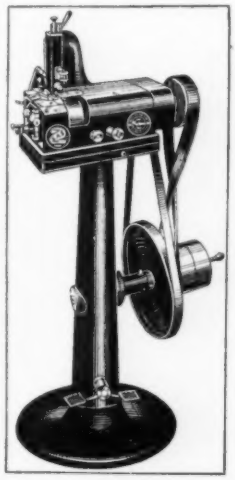


Schopper Shock Tester

An instrument of German manufacture designed for making such tests is here illustrated. It comprises a heavy metal base mounted on leveling screws and provided at one end with means for holding a flat disk of rubber to be tested. On the base is bolted an overhanging arm carrying the hammer and graduated quadrants for measuring the resilience. The entire apparatus is simple, durable and has proved very useful in German factories, in which country it originated. The six mm. thick rubber disks obtained when punching the standard rings for the Schopper-Dalén tensile testing machine can be employed as test pieces. Louis Schopper, Leipzig. H. Z. Schniewind, 72 Duane St., New York, N. Y., U. S. agent.

Column Stand Skiver

AN improved adaptation of a well known bench skiver for cutting heavy tire patches is represented in the illustration. The machine is column mounted and remarkably efficient. The feed roll shaft is driven 3,400 r. p. m. as compared with 1,800 r. p. m. for the bench type machine. This increased speed is of notable advantage when skiving heavy stock.

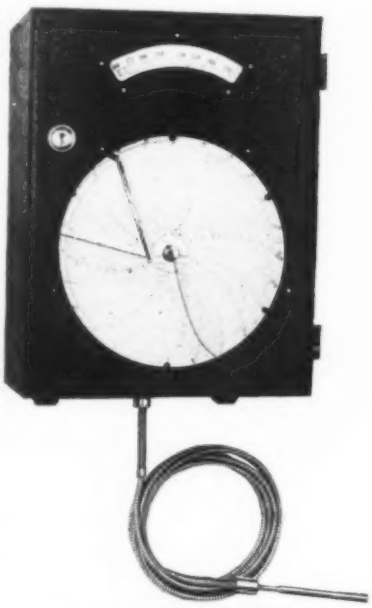


S. A. S. Skiver

The machine is designed to meet the special requirements of manufacturers making tire patches and reliners and for skiving tire casings, inner tubes, etc. It has a bracket mounted on the rear of the frame instead of on the top, which permits the operator to skive or split stock without the frame interfering. This is of particular advantage when skiving reliners and work of that type. The top feeding mechanism is mounted above the table, which permits skives up to 4 or 5 inches wide by a series of 2-inch skives. The feeding mechanism can be removed without tools, and can be replaced when taken out. The machine occupies a floor space of 2½ feet square and is operated by ½ h.p. It can be obtained from the Manufacturers' Supplies Co., 720 North 18th St., St. Louis, Mo.

Recorder Controller

THE instrument pictured combines in one case the features of a recorder and a thermometer controller which offers a more compact outfit than separate instruments. The equipment is a single pen recording device with controller system and scale mounted directly above it. The recording pen and moving contact of the controller are each actuated by separate pressure elements which are exactly alike in construction. These elements are connected through one capillary tube to the sensitive bulb, and arranged in this way the record is not impaired in the slightest degree by retarding effect of the controller. Also the recorder draws a true record both above and below the control point.



Bristol Recorder Controller

This instrument is arranged for a contact capacity of 1,000 watts by equipping it with self-contained automatic switches. Terminals are supplied for making easy connections to line and control apparatus through conduit. All internal circuits are heavily insulated. The large current carrying capacity of this controller makes it possible to adapt the instrument to many control applications without the use of relays.

The case is made of sheet steel and is supplied with a glass over the chart and controller scale. It is equipped with heavy lugs at top and bottom for mounting to wall or other support. The Bristol Co., Waterbury, Conn.

Automatic Rubber Mill Brake

THE brake mechanism here pictured consists of an upright standard which supports a vertical shaft. The lower part of this shaft is threaded. When it is revolved it transmits motion through a trunnion block to a series of levers attached to the brake band. The driving motor for the brake is mounted on the side of the standard and is geared to the screw shaft. A wheel is mounted on the end of the shaft so that hand operation may be obtained at any time.

Motor Operated Brake

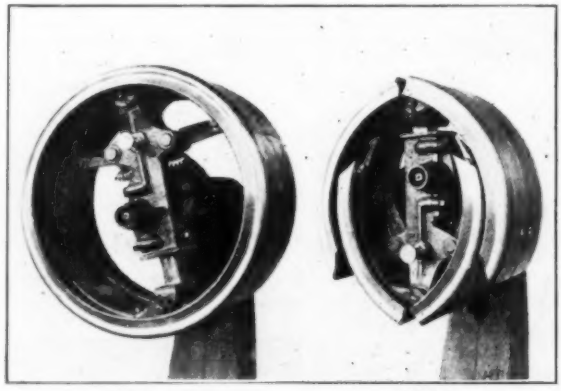
When the brake is being released, the trunnion block travels upward on the screw and is stopped by the tripping of a limit switch when sufficient clearance has been obtained between the brake band and the motor frame. In tightening the brake, the trunnion block moves down on the screw, automatically applying tension to the brake band through the combination of levers and weights until the action is topped by a limit switch. By adjusting the brake lever weights it is possible to vary the starting time of the motor from 5 to 40 seconds.

The balancing of the weight and the closing of the band around the frame take place gradually. The tension is applied at the same speed, regardless of the amount of weight on the lever. Consequently, there is no sudden application of torque to the driven machine. This makes a smooth start possible even when the brake is set for rapid acceleration. Thus, with the automatic brake, hand operation is eliminated except when desired. The super-synchronous motor may be started or stopped by a push button.

The super-synchronous motor on which this brake is used is designed for driving loads where they require more than full load torque before synchronism is reached and on which it is desired to limit the power demand during the starting period to approximately full load values. Typical applications are rubber mill line shafts, machines characterized by heavy flywheel effects, and machines difficult to start when stopped loaded with material. General Electric Co., Schenectady, N. Y.

New Type Tire Chuck

THE new type of steel tire chuck and drum here pictured, in collapsed position, is now being supplied to tire manufacturers in general. The first chuck of this style was built last fall for one of the leading American tire companies, and its efficiency has since been demonstrated by the successful use of several hundred chucks.



OPEN CLOSED

De Mattia Tire Chuck and Drum

The chuck is practically all steel with all pivot bearings bronze bushed. The master drum, which is never removed from the chuck, is operated through rack and pinion and segment gears. The usual hand wheel is employed for moving the chuck mechanism. But one turn of this wheel in one direction only is required to collapse the drum.

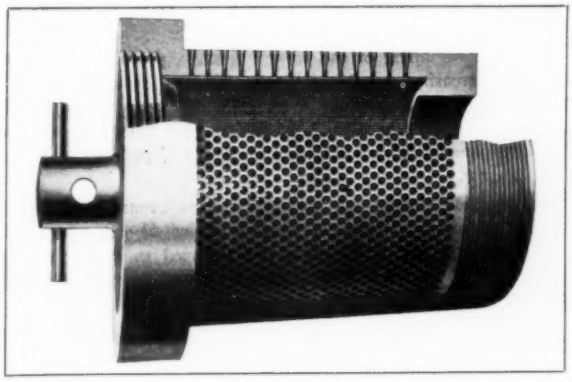
The master drum is furnished to a jig, and dome building forms of any size are interchangeable on the drum. The latter feature is one that is specially commended as desirable. De Mattia Brothers, Inc., Clifton, N. J.

Rubber Strainer Shell

THE strainer head here pictured is of special interest to reclaimers and rubber manufacturers generally, not only by the fact of its ample size and heavy construction which adapt it to meet the demand of continuous service, but also by reason of its special construction.

The shell and cap are made from solid forgings and the holes are taper reamed to relieve internal pressure. It is customary

practice to use two screens of different mesh, the coarser one is placed next to the shell. The shell cap can be arranged for water cooling if desired. The device is so designed that the screens can be changed by removing the cap piece only. Quadruple threads on the cap make its removal easy. In using this shell it is found good policy to feed the machine slowly at the start until enough rubber is in the shell to give sufficient pressure on the screen to hold it in place without turning. Nagle Machine Co., Erie, Pa.



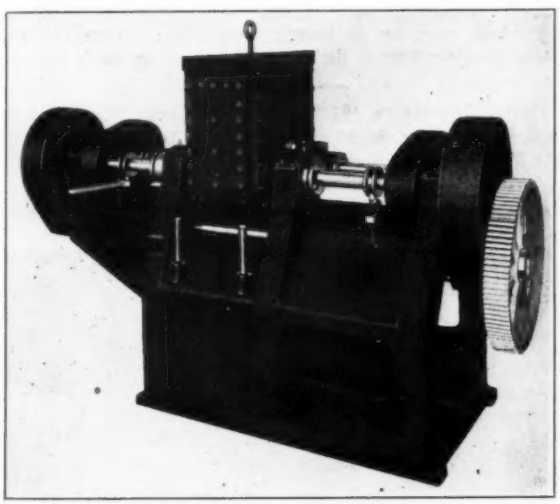
Nagel Screening Head

Experimental Mixer

WHEN a manufacturing process, necessitating the use of mixing machines, is to be worked out on a commercial scale it is essential that the proper selection of the machinery be made to insure the success of the process.

The illustration represents a mixer of recent design. The tank is made of cast iron, bored and machined inside. The jacket extends nearly to the top of the tank and is made of sheet steel bolted over cast iron, and baffled to insure positive circulation of the heating medium. The jacket is designed for a maximum working pressure of 125 pounds. The cast steel agitators are interchangeable, one pull-back lever serving each agitator shaft. An arrangement of double stuffing boxes prevents grease or dirt from being drawn into the tank at the agitator shafts.

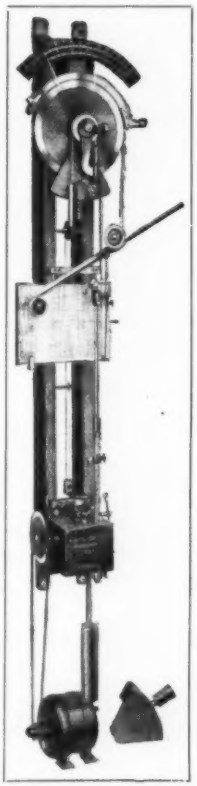
The working capacity is five gallons. Because different styles of agitators can be used in the same machine, with very little time and effort required to make the change, this machine is suitable for plasticizing, compounding, massing of reclaim, dispersion work, heavy doughs, etc. For full particulars apply to The J. H. Day Co., Cincinnati, O.



Day "Mogul" Mixing and Kneading Machine

Single Strand Cord Tester

THE tire designer and compounder requires in his study of tire cord quality and construction numerous facilities for physical testing. Among these should be included a single strand tester here pictured of modern type adapted for testing tire cords. Its chief claim to popular acceptance is from the fact that it returns the test results in stress-strain diagram form and in a magnified test line. The same style of apparatus is also built for hand operation or power operation without the recording device. The machine, however, represents the highest grade machine for making and recording tests of plied yarns or cords.



Scott Cord Tester

The framing is on heavy cast iron rails insuring rigidity and freedom from vibrations. The head of the machine has a double capacity of zero to 25 and zero to 50 pounds. The change from one capacity to the other is made by simply interchanging the head weights. A double dial obviates the necessity of computations.

The recorder on the machine is arranged to show in two inches of its movement, one inch of stretch in the sample, thus giving a magnified graph. Consequently, in testing automobile tire cord of conventional construction when using the 25 pound capacity, the recorder plots a line about 7½ to 8 inches in length clearly showing the movement of the cord under tension.

The movements of the machine being exaggerated, and the graph line thereby being greatly enlarged the apparatus is especially suited for investigation work as well as for routine testing of various kinds.

The net weight of the tester is 200 pounds. The floor space occupied is virtually nothing since the machine is intended to be bolted to the wall or some heavy post with only the motor resting on the floor. Henry L. Scott Co., Providence, R. I.

Nuttall Sales Taken Over by Westinghouse

The Westinghouse Electric & Mfg. Co., 150 Broadway, New York, N. Y., has taken over the sales activity of The R. H. Nuttall Co., manufacturer of gears, pinions, flexible couplings, etc. This company has always kept pace with the demand of industry for constant development and continued progress of its products. These have consistently proved their worth and demonstrated that the company holds place among the acknowledged leaders in the field.

Bus Wheelbase and Tires

Various tire equipment for buses have been tried ranging through solid and pneumatic tires of all types. The old 36 by 4½ inch tire, with a carrying capacity of 1,250 pounds, has been replaced by the 10.5 inch balloon tire with a carrying capacity of 5,500 pounds. The wheelbase has increased from about 160 inches in the beginning of the century to nearly 240 inches at the present time.

Annual Meeting American Society for Testing Materials

The Thirty-first Annual Meeting of the American Society for Testing Materials was held at Atlantic City, N. J., June 25 to 29, 1928.

The annual report of the Executive Committee states that the past year was one of gratifying accomplishment in the affairs of the society. The accomplishment, beginning January 1, 1928, of a class membership of companies, firms, corporations, industrial associations and commercial testing laboratories at increased annual

Committee D-13 on Textile Materials submitted two new tentative specifications and a number of tentative definitions as follows: dues of $30, has been successfully accomplished.

(1) Tentative Specifications for Tolerances and Test Methods for Asbestos Yarns; (2) Tentative Specifications and Tolerances for 23/5/3 Carded American Tire Cord; (3) Tentative Definitions and Terms Relating to Textile Materials.

The first of the new tentative specifications is the first formal result of the work of sub-Committee XVI on Asbestos Textiles. The original request for standards on asbestos textiles was received from one of the large users of insulating materials for electrical purposes. On canvassing the field it was thought best to first prepare tentative specifications for asbestos yarn in general and to take up later specific insulating materials and other asbestos textile materials.

The second of these new tentative standards is the first formal result of the new departure of Committee D-13 to write specifications for textile materials for specific uses. These specifications were prepared in response to a number of requests received from producers and non-producers for definite specifications covering carded American tire cord.

The third is a series of definitions relating to yarns, cords and fabrics to be incorporated, if finally advanced to standard, in the Standard Definitions of Terms Relating to Textile Materials.

Harlan A. Depew[1] read a paper entitled "An Explanation of Some of the Difficulties in Abrasion Testing of Rubber," of which the following is the author's synopsis:

The paper discusses abrasion resistance of rubber, pointing out that the author's tests have indicated that abrasion resistance is not a fundamental property but is rather the resultant of resistance to cutting and tearing.

An abrasion machine used at the beginning of the investigation gave satisfactory relative abrasion resistance on many rubber stocks, but not on unusually hard or soft stock. Examination of the abraded surfaces showed that the test was largely a cutting test. A modified machine was then constructed which made the test largely a tearing test, and abrasion resistance as determined on the modified machine is more nearly in accord with actual experience with rubber of all cures. The paper presents certain abrasion test data obtained with the two machines, and modifications are described by which the test can be made more of a cutting test or a tearing test as specific needs may require.

[1]Research Division, New Jersey Zinc Co., Palmerton, Pa.

Institute of Chemistry

The second session of the Institute of Chemistry of the American Chemical Society opened June 23 at Evanston, Ill., and will continue to August 18. Among the speakers announced is the well known rubber technologist, Thomas Midgley, Jr., who will discuss the present status of artificial rubber. He is now devoting his attention to the problem of the commercial synthesis of rubber.

Congress Honors Edison

In recognition of his services to humanity, Congress has unanimously voted to present a gold medal to Thomas A. Edison. The resolution provides that duplicates of the medal in bronze shall be coined and sold.

World Supply of Balata

No attempt has yet been made to produce balata on plantations, South America furnishing the world's supply from trees growing wild in the forests. The wasteful production methods hitherto employed have denuded trees in the more accessible regions and now call for new sources to be developed.

Since the beginning of the present century, production has been steadily increasing as the following figures demonstrate: The average annual production from 1906 to 1910 was 5,990,000 pounds; from 1911 to 1915, 7,365,000 pounds; from 1916 to 1920, 9,220,000 pounds; from 1921 to 1925, 9,986,000 pounds; and from 1923 to 1926, 11,214,000 pounds.

Considerable change can be noted in the countries leading as sources of supply, Venezuela which supplied 63 per cent of the total output in the 1906-1910 period dropped to 20 per cent in the 1923-1926 period. The Amazon Valley is now the chief source of supply.

WORLD PRODUCTION (EXPORTS) OF BALATA, 1919 TO 1926

POUNDS

Year	Panama	Colombia	Venezuela	Trinidad	British Guiana
1919	1,180,363	525,202	2,468,281	6,402	1,405,215
1920	400,395	[1]202,894	3,114,840	6,778	1,074,640
1921	201,981	[1]116,874	2,158,312	2,047	1,390,402
1922	314,674	247,661	2,195,782	3,593	912,320
1923	159,099	334,572	2,700,389	494	1,026,368
1924	73,430	375,763	2,362,700	0	1,370,212
1925	223,780	550,467	2,776,004	0	904,784
1926	[2]202,527	[2]440,264	1,316,639	0	597,401

[1] Imports into United States.
[2] Imports into United States and United Kingdom.

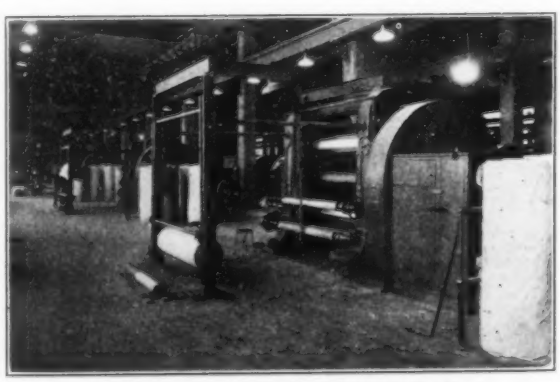
POUNDS

Year	Surinam	French Guiana	Brazil	Peru	Total
1919	1,088,867	2,124,505	79,628	.....	8,878,463
1920	953,994	2,416,195	103,338	3,560	8,276,634
1921	1,023,900	2,197,479	228,421	31,233	7,350,649
1922	872,012	1,445,095	592,773	1,961,236	8,545,146
1923	1,691,008	1,331,296	685,210	3,230,965	11,159,401
1924	1,224,968	1,009,054	879,455	3,667,833	10,963,495
1925	1,515,475	963,498	1,403,149	3,571,364	11,908,521
1926	1,036,365	429,529	2,308,798	4,514,869	10,846,392

Grade Crossing Menace

J. Borton Weeks, president of the Motorists' Association, is of the opinion that the action of the Interstate Commerce Commission on block signal reform should be deferred until a far more serious menace has been righted. Figures of the commission show that from ten to twenty times more fatalities occur at grade crossings than as the result of lack of automatic control.

CHICLE IMPORTS IN 1927 FELL 8 PER CENT BELOW THE 1926 total, the value for the latter year being $6,204,000 against $6,156,000 for the former year.



A GROUP OF 24 x 66-INCH 3-ROLL FARREL-BIRMINGHAM CALENDERS

Rims Inspected and Approved by The Tire & Rim Association of America, Inc.

Rim Size Motorcycle	May, 1928 Number	May, 1928 Per Cent	5 Months, 1928 Number	5 Months, 1928 Per Cent
24 x 3	628	0.0	17,800	0.1
26 x 3	5,722	0.2	20,198	0.1
28 x 3	301	0.0	753	0.0
Total	6,651	0.2	38,751	0.2
Clinchers				
30 x 3½	38,191	1.8	175,376	1.7
31 x 4	405	0.0	1,968	0.0
Total	38,596	1.8	177,344	1.7
18" Balloons				
18 x 3½	.....	...	9,362	0.1
18 x 4	139,337	6.4	609,420	5.8
18 x 3.25	15,285	0.7	15,285	0.1
18 x 4½	22,790	1.1	53,633	0.5
18 x 5	58	0.0	78	0.0
Total	177,470	8.2	687,778	6.5
19" Balloons				
19 x 3½	222,845	10.2	961,300	9.0
19 x 4	217,348	9.9	997,006	9.5
19 x 3.25	4,741	0.2	4,741	0.0
19 x 4½	93,193	4.3	453,785	4.5
19 x 5	1,658	0.1	1,690	0.0
Total	539,785	24.7	2,418,522	23.0
20" Balloons				
20 x 2.75	4,048	0.2	4,048	0.0
20 x 3½	48,503	2.2	313,590	3.0
20 x 4	258,847	11.9	1,572,794	15.9
20 x 4½	23,577	1.1	162,653	1.6
20 x 5	48,307	2.2	238,218	2.5
20 x 6	12,355	0.5	54,423	0.5
Total	395,637	18.1	2,345,726	23.5
21" Balloons				
21 x 3½	66,013	3.0	292,677	2.8
21 x 2.75	556,611	25.7	2,763,044	25.2
21 x 4	57,779	2.6	376,045	3.6
21 x 4½	36,168	1.7	220,792	2.1
21 x 5	525	0.0	6,156	0.1
21 x 6	.....	0.0	1,385	0.0
Total	717,096	33.0	3,660,099	33.8
22" Balloons				
22 x 3½	.....	0.0	1,509	0.0
22 x 4	709	0.0	1,565	0.0
22 x 4½	.....	...	640	0.0
Total	709	0.0	3,714	0.0
High Pressure				
30 x 3½-23	10,508	0.5	26,947	0.2
31 x 4-23	640	0.0	640	0.0
32 x 4½-23	7,158	0.3	28,571	0.3
32 x 4-24	10,978	0.5	29,811	0.3
33 x 4½-24	.....	...	406	0.0
32 x 3½-25	.....	...	.....	...
33 x 4-25	.....	...	1,293	0.0
34 x 4½-25	2,914	0.1	4,127	0.0
Total	32,198	1.4	91,795	0.8
20" Truck				
30 x 5	185,023	8.5	806,739	7.6
32 x 6	50,735	2.3	161,593	1.5
34 x 7	14,171	0.6	47,323	0.5
36 x 8	7,549	0.4	28,039	0.3
40 x 10	.....	...	2,142	0.0
Total	257,478	11.8	1,045,836	9.9
22" Truck				
36 x 7	149	0.0	2,798	0.0
38 x 8	200	0.0	200	0.0
Total	349	0.0	2,998	0.0
24" Truck				
34 x 5	2,499	0.1	9,038	0.1
36 x 6	4,210	0.2	19,982	0.2
38 x 7	5,139	0.2	22,559	0.2
40 x 8	4,799	0.2	12,373	0.1
44 x 10	.....	0.0	480	0.0
Total	16,647	0.7	64,432	0.6
Airplane				
12 x 3	11	0.0	11	0.0
24 x 3	.....	...	56	0.0
20 x 3½	49	0.0	226	0.0
26 x 3½	.....	...	345	0.0
20 x 4	20	0.0	20	0.0
20 x 5	8	0.0	8	0.0
32 x 6	380	0.0	2,066	0.0
18 x 4 Cl	2,508	0.1	4,859	0.0
Total	2,976	0.1	7,591	0.0
Grand total	2,185,592	...	10,544,586	...

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
1107	Source of supply for trademark labels for rubber soles.
1108	Consulting rubber engineering company.
1109	Machine for cementing rubberized fabrics together.
1110	Rubber tank linings.
1111	Manufacturers of diving suits.
1112	Source of supply for scrap sponge rubber.
1113	Heel and sole trimmers.
1114	Sponge rubber inner tubes.
1115	Manufacturer of "Foam" rubber.
1116	A concern which can impregnate sheetings with oil.
1117	Makers of shellac compositions.
1118	Location of the Rubber Welfare Association.
1119	Manufacturers of molded rubber croquet balls.
1120	Machine to cut tubing directly from the tuber.
1121	Manufacturer of Malm rubber brush.
1122	Source of supply for reclaiming oil.
1123	Elapsed time recorder for vulcanizer.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country	Purchase or Agency
31,346	Bathing caps, slippers and druggists' sundries	Alexandria, Egypt	Agency
31,358	Tires	Johannesburg, South Africa	Agency
31,391	Tires	Paris, France	Agency
31,407	Automobile rubber goods	Amritsar, India	Both
31,408	Tires	Danzig, Germany	Agency
31,410	Fan belts	Durban, South Africa	Agency
31,417	Erasers and rubber bands	Leipzig, Germany	Either
31,423	Toys	Nuremberg, Germany	Both
31,433	Belting	Cape Haitien, Haiti	Purchase
31,442	Rubber lined leggings and haversacks	Cardiff, Wales	Agency
31,443	Technical rubber goods	The Hague, Netherlands	Agency
31,444	Balloons and toys	Madras, India	Agency
31,449	Dental rubber	Constantza, Rumania	Both
31,486	Overshoes	Damascus, Syria	Agency
31,507	Overshoes	Damascus, Syria	Purchase
31,549	Erasers	Riga, Latvia	Agency
31,550	Rubber sheeting	Cardiff, Wales	Agency
31,551	Bathing caps and shoes	Santiago, Chile	Agency
31,552	Tires	Alexandria, Egypt	Agency
31,557	Erasers	Rosario, Argentina	Both
31,590	Bathing caps, rubber clothing and toys	Zagreb, Yugoslavia	Both
31,595	Balloons	Munich, Germany	Both
31,674	Druggists' sundries	Progreso, Mexico	Purchase
31,703	Rubber goods	Rio de Janeiro, Brazil	Agency
31,712	Surgical rubber goods	Madrid, Spain	Agency
31,715	Belts and tobacco pouches	Montevideo, Uruguay	Purchase
31,716	Raincoats	Lausanne, Switzerland	Purchase
31,717	Surgical rubber goods	Zagreb, Yugoslavia	Both
31,746	Tires	Munich, Germany	Purchase
31,810	Canvas shoes	Damascus, Syria	Agency
31,819	Shoes	Munich, Germany	Agency

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
1963	British Malaya—Imports and Exports, 1927.
1970	Rubber and Balata Belting Exports.
1972	Rubber Sundries and Specialties.
1978	Brazilian Tire Market.
1985	Rubber Footwear Exports.

American Firm in Japan

It is reported that the increase in sales of tires in Japan has influenced one American firm to establish a factory at Tsurumi, near Yokohama. Capital, it is said, will be largely supplied by Japanese, who will also predominate in the personnel of the plant.

Editor's Book Table

Book Reviews

"Chemical Encyclopaedia." An epitomized digest of chemistry and its industrial applications, by C. T. Kingzett. Fourth edition, New York, D. Van Nostrand Co. Cloth, 807 pages, 6 by 9 inches.

This reference book is of great practical value designed as it is to make readily accessible information respecting thousands of materials used in the trades, arts and industries. Its alphabetical arrangement, concise, accurate descriptions in clear print, combine to make the book a most desirable one for library or laboratory use.

"Facts Affecting the Importation of Rubber Tires and Tubes Throughout the World." 1927 edition. Prepared by the Rubber Division for the use of American exporters. Published by the Department of Commerce, Washington, D. C. Paper covers, approximately 250 pages, 8½ by 11 inches. Mimeographed, indexed.

This authoritative compilation of statistics and other data regarding the export trade in tires and tubes is arranged alphabetically by countries. The standard arrangement is as follows: 1. Automotive Statistics; 2. Tire Statistics; 3. General Information. Copies of this manual have been issued to American exporters of tires and tubes and is not to be given secondary distribution.

"Standards in Industry." The Annals, May, 1928. The American Society of Political Science, 3622 Locust St., Philadelphia, Pa.

The Annals is published six times a year and deals with the most prominent current social and political problems. The May issue, under the special editorship of Richard H. Lansburgh, contains 36 papers in which the value and importance of standardization is discussed as affecting four divisions of modern life as follows: 1. Standardization Programs in Industry; 2. Standardization Programs of Specific Industries; 3. Standardization Programs Outside of Industry; 4. Standardization and the Consumer.

"La Linoxyne et le Linoleum." By A. D. Luttringer. Published by A. D. Cillard, 49 Rue des Vinaigriers, Paris, as part of the *Encyclopedia of Rubber and of Plastic Substances.*

This new volume, published in French, is devoted to linoxyne and linoleum. The work includes: (1) Properties and tests of linseed oil; (2) Linoxyne; (3) Linoleum; (4) Test and analysis of linoleum.

The two first parts cover not only the linoleum industry, but also the varnish industry and numerous users of linseed oil. An appendix reviews some allied industries: lincrusta, oil cloths, and oiled cloth products with cork basis, etc. The work ends with a bibliography and an alphabetically arranged index of names of authors and of materials.

"Standards Yearbook—1928." Compiled by The National Bureau of Standards, George K. Burgess, director. Published by the Government Printing Office, Washington, D. C. Cloth, 6 by 9 inches, 399 pages, tables, graphs.

This second issue of the Standards yearbook is devoted to outlines of the activities and accomplishments of not only the National Bureau of Standards and other agencies of the Federal Government and the states, counties and municipalities, but also those of technical societies and trade associations, with special emphasis on their accomplishments during the year 1927 with programs for future work. A special feature is made of the accomplishments and current activities of various foreign national and several international standardizing agencies.

One division is devoted to rubber with special reference to its standardization and properties, use and care of tires, balloon tire tests, rubber floor tile, garden hose and investigations on rubber and packings.

A chapter is given to the standardizing activities of technical societies and trade associations which includes a description of The Rubber Association of America, Inc., and The Rubber Heel Club of America.

New Publications

"Department of Commerce Promotes Exports of Automotive Products" is the title of a 27-page booklet which, as its title indicates, is devoted to a description of the chief functions of the Bureau of Foreign & Domestic Commerce. The Rubber Division is shown as an important factor which has accomplished much to avoid the curtailment of automobile production because of a shortage of crude rubber. Of interest too is the compilation showing the stocks of automobile tires in the hands of dealers throughout the United States, a survey which is compiled semi-annually by this division.

"1928 Year Book" has been compiled by The Tire & Rim Association of America, Inc., 1401 Guarantee Title Bldg., Cleveland, O. Much interesting and informative data have been collected in the book which is divided into six sections: passenger car equipment; truck and bus equipment (pneumatic); truck and bus equipment (solid and cushion); airplane equipment; motorcycle equipment; and miscellaneous.

The De Laval Steam Turbine Co., Trenton, N. J., has distributed a leaflet describing the new Spokane Up-river Pumping Station, the pumping equipment of which was supplied by the De Laval company.

The Bristol Co., Waterbury, Conn., has issued a new liquid level catalog No. 1,800 and a counter bulletin No. 365.

"The Statistical Position of Rubber." This bulletin, issued May 19, 1928, by Charles T. Wilson Co., Inc., 44 Beaver St., New York, N. Y., presents an analysis of the current rubber situation in an endeavor to arrive at a conclusion as to the probable effects of the decision of the British Government to remove as from Nov. 1, 1928, all restrictions on the export of British controlled plantation rubber.

"Compounding Materials Used in the Rubber Industry (Classification and Health Hazards), Part I—Accelerators and Dry Organic Compounds. Safe Practices Pamphlet—Rubber No. 1." Published by National Safety Council, 108 East Ohio St., Chicago, Ill. The National Safety Council says of this publication that it is a compilation of experience and is not to be confused with federal, state or insurance requirements or with national safety codes. The material was first presented at the Rubber Section meeting of the Sixteenth Annual Safety Congress, Chicago, 1927, by L. J. D. Healy, technical superintendent, The Fisk Rubber Co., Cudahy, Wis.

"Cotton Fabrics and Their Uses." This pamphlet of 36 pages is issued by the Dept. of Commerce, Bureau of Foreign and Domestic Commerce, Textile Division, Washington, D. C. It outlines the current uses of cotton and is a direct result of what 15,000 American manufacturers and distributers have reported. The compilations represent part of a study to develop new and extended uses for cotton undertaken by the Department of Commerce under authority of Congress. A similar study is in progress by the Department of Agriculture and by the Cotton Textile Institute, Inc., the work of the three agencies being conducted under a coordinated plan.

The hard part of making good is that you must do it over every day.—INCOME.

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World Motor Vehicle Census, January 1, 1926, 1927, and 1928

Compiled by Automotive Division, Department of Commerce, Washington, D. C.

COUNTRY	Passenger Cars	Buses	Trucks	Total Automobiles	Motorcycles
Argentina	224,803	1,300	39,927	266,030	2,017
Australia and Tasmania	346,885	1,051	75,585	423,521	84,683
Belgium	72,000	.....	36,000‡	108,000	31,000
Brazil	95,000	1,000	40,000	136,000	800
Canada	840,336	1,196	107,972	949,504	7,604
Denmark	66,000	900	17,000	83,900	22,000
France	656,000	10,000	290,000	956,000	158,000
Germany	332,000	7,000	117,000	456,000	405,000
India	73,698	.....	21,986‡	95,684	14,294
Italy	120,000	3,600	35,000	158,600	53,500
Mexico	42,046	3,595	11,498	57,139	548
Netherlands	46,977	3,102	23,815	73,894	28,965
New Zealand	111,385	1,153	21,677	134,215	35,071
Scotland	71,000	4,500	26,200	101,700	52,000
Spain	134,050§	.....	42,025	176,075	18,125
Sweden	81,465	1,827	26,230	109,522	38,340
Switzerland	43,450	550	9,000	53,000	32,000
Union of S. Africa	93,000	700	7,500	101,200	32,000
United Kingdom (England and Wales)	769,000	37,500	264,500	1,071,000	632,000
United States	20,279,661	85,636	2,896,886	23,262,183	124,359
Other countries	669,985	39,772	204,376	914,133	171,923
Total, 1928	25,168,741	204,382	4,314,177	29,687,300	1,944,229
Total, 1927	23,491,763	178,478	3,923,968	27,594,209	1,674,720
Total, 1926	20,837,146	172,617	3,463,856	24,589,249	1,435,147

‡Includes buses with trucks.
§Includes buses with passenger cars.

New Goods and Specialties

Beach Wear

Many novelties for beach wear are offered by The North British Rubber Co.,

Helmet Cap

Ltd., 200 Tottenhtam Court Rd., London, W. 1, England. The bathing cap illustrated is of the helmet type, all rubber molded, with stud or buckle fastener.

Metallic Luster Bottle

Jazz Luster

A new departure in hot water bottles is being introduced by the Reliance Rubber Co., Ltd., Formosa St. and Amberley Rd., Paddington, London, W. 9, England. A metallic effect converts the useful and necessary bag into an artistic and ornamental article. A moire design has also been added to the general line, and the best sellers are plain, silver, gold or the jazz luster illustrated. The bag is offered in the three quart or Baby de Luxe size.

Can Top Roughener

The top of the heat and patch unit can, manufactured by the Shaler Co., Waupun, Wis., is so made that it may be used for roughening punctured tubes before vulcanizing. It is of the screw type and cannot easily be lost, as the separate roughener so often is, and an inside backing keeps moisture out of the can.

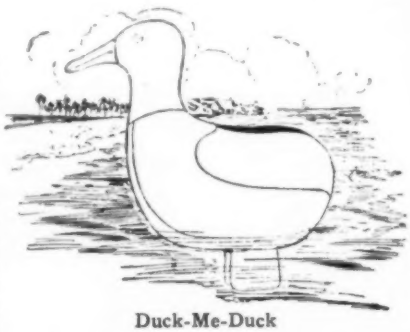
Handy Roughener

Rubber Jewelry

The fad for brilliant colored beads has infected the habitués of the beaches who indulge their love of the bizarre by decking themselves in rubber necklaces of the same bright hue as the bathing caps and ensembles of the mode. This rubber jewelry is not confined to chains, however, but may be had in bracelets, wrist watches and rings set with synthetic stones.

Duck for Water Sports

A large mountable duck able to support the weight of a child and ride him gracefully through the water is said to be a great hit by the manufacturer, The



Duck-Me-Duck

Moneco Co., 780 State St., New Haven, Conn. The outer cover is made of rubberized fabric, finished in several color combinations, with a bladder the same size and shape as the duck.

Inflated Boat

The Ayrflote is an inflated boat with safety air chambers. It is compact and easy to carry when deflated, weighs but fifteen pounds and rolls into a small bundle 18 by 12 by 8 inches. There is no framework to add to its bulk and the fabric used is specially rubberized by the du Pont Company. Three distinct rubber surfaces are used, each one of which is waterproof in itself, and the bottom is made of extra

Ayrflote

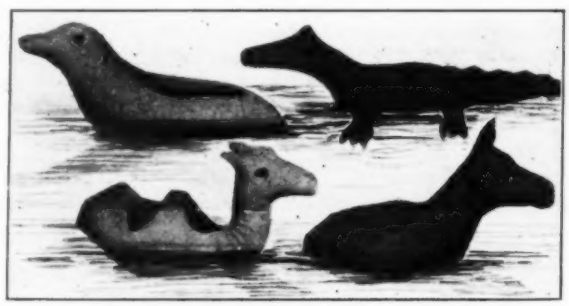
strong rubberized canvas. The bottom of the boat is not flush with the bottom of the air chambers, but is built up about two inches, creating a partial vacuum under the bottom, making it practically impossible to capsize. It is constructed in separate air chambers, and if punctured only one chamber will be deflated.—Clarke Mfg. Co., Inc., 45-49 Fair St., New Haven, Conn.

Acid-Proof Apron

An all-rubber apron is one of the latest products of the Gates Rubber Co., Denver, Colo. Marketed through regular jobber channels, this apron is finding much favor among battery men as well as on the car washer rack. Because it is all-rubber, it is fully acid-proof as well as waterproof, and is not subject to destructive attack as a rubberized fabric is as soon as the rubber coating wears.

All-Rubber Apron

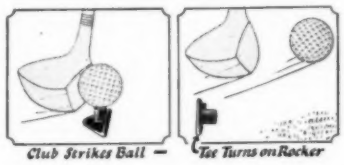
Inflatable Rubber Beach and Swimming Pool Animals from The Bing Corp., 33 E. 17th St., New York, N. Y.



Auto Top

Rumble Seat Top

Easy to attach and ready for use in five minutes, the rumble seat top fastens to the back of the rumble seat and regular top of the car. It is made of a serviceable rubberized material in black or sport colors to harmonize with the car top. A utility bag is furnished in which the top, being collapsible, can be folded. Hampden Auto Top & Metal Co., Springfield, Mass.



Par-Tee

Golf Tee

A scientifically designed golf tee, made of pure red rubber, the Par-Tee, is constructed upon mechanical principles. The rocker motion by which the tee turns over as soon as the club comes into contact with the ball, permits the club to follow through without the least resistance. It may be set on any surface: sand, clay, mud, grass or snow and is ideal for indoor golf, replacing the usual mat. It is only necessary to carry one. Par-Tee, Inc., 1105 Guarantee Title Bldg., Cleveland, O.

Hosiery Protector

A protector for the stocking is a recent invention of Norman H. Lake of

Conformo

Boston whose product is being sold by the Hosiery Protector Co., also of Boston, Mass. It can be hooked and unhooked in four or five seconds and has been named Conformo because, it is claimed, it conforms perfectly to the shape of the leg.

Colored Golf Balls

With the object of greater visibility, the Wilson-Western Sporting Goods Co., 2037 Powell Ave., Chicago, Ill., has introduced the colored golf ball. The response from golfers all over the country has more than justified the manufacturer in making the experiment, the demand far exceeding the supply on hand. Two colors, bright canary yellow and flashing oriole orange were selected and it is planned to add two more. The colored ball does not pick up the dirt or grass stains as quickly as the white ball and is more readily located. The balls, Hol-Hi and Dura-Dist, are well constructed along scientific principles resulting in controlled performance and long flight.

Anti-Splash Heel

Utilizing the heel as a galosh is the newest method of protecting the stocking

Floral Prints

from mud and dirt. A layer of sponge rubber absorbs moisture and prevents splashing.

Vacuum Cup Golf Ball

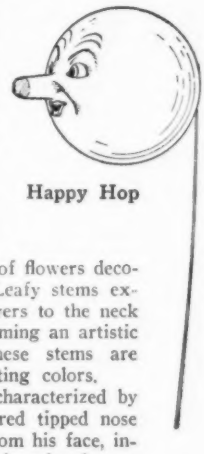
The four point vacuum golf ball is said to be suitable for every kind of golfer and combines distance, accuracy, and durability with a reasonable price within the reach of all players. The ball is machine wound over a liquid center for a long carry, accurate flight and true roll. The cover is guaranteed not to cut in 72 holes and is so resilient that it can't be battered out of

shape. The manufacturer is the Pennsylvania Rubber Co. of America, Inc., Jeanette, Pa.

Golf Ball

Toy Balloons

Two new toy balloons just introduced to the trade by The Oak Rubber Co., Ravenna, O., are the floral striped print and Happy Hop.



Happy Hop

The floral prints are gorgeously colorful, various kinds of flowers decorating the tops. Leafy stems extend from the flowers to the neck of the balloon, forming an artistic stiped effect. These stems are printed in contrasting colors.

Happy Hop is characterized by the long pointed, red tipped nose which sticks out from his face, instead of being merely printed upon the balloon as is usually the case with "face" balloons. It is intended primarily as a reed stick item.

Puncture Proof Tire Casing

Gostlin Tire

A combination of steel and rubber is used by the Karg Tire & Rubber Co., 6555 W. 65th St., Chicago, Ill., for a puncture proof tire casing. Two layers of non-crystallizing flexible steel, overlapping but not touching one another, are vulcanized by a secret process to a rubber coated fabric, the steel layers acting in unison with the tire casing. The total weight of the steel strips is approximately one pound in small size tires.

Financial and Corporate News

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Akron Rubber Reclaiming Co..	Pfd.	$2.00 q.	July 2	June 20
Akron Rubber Reclaiming Co..	Com.	$0.50 s. a.	July 15	July 5
Boston W. H. & R. Co.....	Pfd.	$3.00 s. a.	June 15	June 1
Boston W. H. & R. Co.....	Com.	$1.50 q.	June 15	June 1
Dayton Rubber Mfg. Co....	Pfd.	$3.50	July 1	June 15
Dayton Rubber Mfg. Co....	A Com.	$1.75	July 1	June 15
Faultless Rubber Co.....	Pfd.	1¾% q.	July 2	June 15
Faultless Rubber Co.....	Com.	$0.50 q.	July 2	June 15
Firestone Tire & Rubber Co	6% Pfd.	1½% q.	July 15	July 1
B. F. Goodrich Co.....	Pfd.	$1.75 q.	July 2	June 8
B. F. Goodrich Co.....	Com.	$1.00 q.	June 1	May 10
Goodyear Textile Mills.....	Pfd.	1¾% q.	July 2	June 20
Goodyear Tire & Rubber Co.	1st Pfd.	$1.75 q.	July 1	June 1
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	July 1	June 1
Goodyear Tire & Rubber of Calif.	Pfd.	1¾% q.	July 2	June 20
Goodyear Tire & Rubber of Canada	Pfd.	1¾% q.	July 3	June 15
India Tire & Rubber Co....	Pfd.	1¾% q.	July 2	June 20
Mohawk Rubber Co.....	7% Pfd.	1¾ %q.	July 2	June 19
Overman Cushion Tire Co..	Pfd.	$1.75 q.	July 1	June 22
Overman Cushion Tire Co..	A Com.	$0.37½ q.	July 1	June 22
Overman Cushion Tire Co..	B Com.	$0.37½ q.	July 1	June 22

Akron Rubber Stock Quotations

June 21, 1928

Company	Bid	Asked
Akron Rubber Reclaim	17	21½
Akron Rubber Reclaim, pfd.....	...	98
Falls	10	11½
Faultless	30½	33
Firestone	169	171
Firestone, 6% pfd.	110	...
Firestone, 7% pfd.	109	109¼
General	172	175
General, 6% pfd.	96½	99½
Goodrich	70	71½
Goodrich, pfd.	111¼	114
Goodrich, 6½s	107½	108½
Goodyear	48½	50¼
Goodyear, 1st pfd.	93⅜	95
Goodyear, 5s 28	99½	100½
Goodyear, 5s 57.....	90¼	90¾
Goodyear, 5½s 31	99⅞	100⅞
India	30	33½
India, pfd.	7	13
India, 7% pfd.	97	100
Mason, A com.....	1⅜	...
Mason, B com.....	¾	1¼
Miller	19	20½
Miller, 8% pfd.	75	77¾
Mohawk	130	134
Mohawk, 7% pfd.	86	90
Rubber Service	...	39
Seiberling	38½	40
Seiberling, 8% pfd.	105	107½
Star	...	1

New York Stock Exchange Quotations

June 22, 1928

Company	High	Low	Last
Ajax Rubber, com.....	8	7⅛	7⅛
Fisk Rubber, com.....	12⅝	12⅛	12¼
Fisk Rubber, 1st pfd. (7).....	82	82	82
Goodrich, B. F. (4).....	71⅝	69½	69½
Goodyear Tire & Rubber, com.....	48½	45½	46
Goodyear Tire & Rubber, 1st pfd. (7).....	94½	94¼	94¼
Intercontinental Rubber, com.....	9	9	9
Kelly-Springfield Tire, com.....	18⅝	17⅝	18⅛
Kelly-Springfield Tire, 8% pfd.	63½	63½	63½
Lee Rubber & Tire.....	18	18	18
Miller Rubber, com.....	19½	19½	19½
U. S. Rubber, com.....	34	32	33
U. S. Rubber, 1st pfd.	65½	62½	63

Norwalk Tire & Rubber Co.

The Norwalk Tire & Rubber Co. reports for the quarter ended March 31, a net loss of $41,018 after expenses, depreciation and other charges, comparing with a net loss of $7,634 in the preceding quarter and a net loss of $46,953 in the March quarter of 1927. For the six months ended March 31, net loss totaled $48,653 after the above charges, comparing with a net loss of $110,849 in the corresponding period of the previous year.

Hood Rubber Co. Defers Dividend

A decrease in footwear sales due to the past mild winter combined with the recent decline in the price of crude rubber has caused the Hood Rubber Co. to defer payment on the regular quarterly dividend of its common stock due June 30. The treasurer, Donald T. Hood, in a letter to common stockholders, says:

At the end of 1927, the company was showing good earning power and the prospects for this year's business appeared promising. At that time rubber was selling at over 40 cents per pound. Since the first of the year the price has fallen from 42 cents in January to about 19 cents. While the actual stock of crude rubber on hand and contracted for has been lower than any time in the past five years, the direct and indirect effects of the drop in price have caused your directors to feel that the only conservative act is to omit dividends at the present time. Tire sales have been delayed and a mild winter brought sales of rubber footwear below expectations. At the present time the orders on hand for fall delivery of rubber footwear are larger than those received a year ago. Tire sales are improving and sales of other products continue to grow. The company is in strong financial condition. Because of the seasonal nature of our business we usually sell over 60 per cent of our products in the last half of the calendar year. Because of the orders on hand we look forward to a satisfactory business for the balance of the year.

New Incorporations

Archer Rubber Products Co., Inc., June 15 (New York), capital stock 100 shares no par value. D. R. and M. C. E. Archer, both of 1524 Union St., Brooklyn, N. Y., and J. Y. Wax, 304 Vine St., Hartford, Conn. Principal office, Manhattan. To manufacture and deal in mechanical rubber goods, etc.

Azif & Schomer Co., Inc., May 25 (New York), $5,000. B. B. Lifflander, H. A. Berman and B. D. Vinegrad, all of 1540 Broadway, New York, N. Y. Principal office, Bronx County, New York, N. Y. To manufacture and sell auto tires, etc.

Bristol Scrap Rubber Corp., The, June 18 (New York), $5,000. B. Gottschalk, 415-86th St., M. Picarsky, 331 Bristol St., and L. Pollack, 345 Bristol St., all of Brooklyn, N. Y. Principal office, Manhattan. To deal in scrap rubber.

Everlastik Webbing Export, Inc., May 19 (New York), capital stock 100 shares no par value. L. R. Browne, B. T. Martin and J. E. Page, all of 395 Broadway, New York, N. Y. To manufacture and sell elastic products.

Edward Krieger Raincoat Corp., May 25 (New York), capital stock 200 shares no par value. E. I. Krieger, N. I. Finn and S. J. Pascowitz, all of 15 Central Park West, New York, N. Y. Principal office, Manhattan. To manufacture raincoats, etc.

Long Beach Tire Co., Inc., June 12 (New York), $2,500. M. Latzer and S. E. Latzer, both of 203 Second Ave., New York, N. Y., and G. M. Dennis, 4 Roosevelt Ave., Roosevelt, L. I., N. Y. Principal office, Long Beach, N. Y. To manufacture tires and deal in auto supplies.

Schwartz Bros.-Levay, Inc., June 4 (New York), $100,000. M. Schwartz and C. Schwartz, both of 322 Chancellor Ave., Newark, N. J., and I. T. Levay, 1522 W. 1st. St., Brooklyn, N. Y. Principal office, Manhattan. To manufacture tires and auto accessories.

Stevens Tire Service, Inc., May 24 (New York), $50,000. N. B. Stevens, 519 So. Clinton St., Syracuse, N. Y., V. M. Greer, 29 Irene Ave., and F. R. Knecht, 106 Borton Ave., both of Akron, O. Principal office, Syracuse, N. Y. To manufacture auto tires, etc.

Surpass Tire Co. of America, Inc., March 13 (New York), $100,000. F. R. Leonori, 267 Lincoln Place, H. Bonawitz, 701 Halsey St., both of Brooklyn, W. R. Meissner, 97 Water St., New York, both in N. Y. Principal office, Brooklyn, N. Y. To manufacture tires.

Ultra Manufacturing Corp., May 22 (New York), capital stock 200 shares no par value. D. Fredman, 158 Magnolia Ave., Jersey City, N. J., M. D. Pinner, 252 Wadsworth Ave., and H. Young, 1749 Topping Ave., both of New York, N. Y. Principal office, Manhattan. To manufacture novelties made of rubber.

U. S. Waterproof Products Corp., May 11 (New York), $20,000. M. S. Diamond, M. Diamond and S. A. Molnar, all of 56 Bay St., St. George, S. I., N. Y. Principal office, Richmond County, New York, N. Y. To manufacture waterproof products.

Warner Tire Co., Inc., May 22 (New York), $10,000. H. Silver and C. Greenberg, both of 309 W. 50th St., and G. Beyer, 344 W. 51st St., all of New York, N. Y. Principal office, Buffalo, N. Y. To manufacture tires, tubes, etc.

The Rubber Industry in America

Ohio

Frank Maranville, nationally known manufacturer and inventor, who with Louis Chevrolet designed and built the first Chevrolet automobile and who also invented the friction top paint can and more than 30 other everyday necessities now in use in America, is a full time engineer at the General Tire & Rubber Co.'s plant in Akron, Ohio.

The Fairfield Rubber Co., Lancaster, O., recently incorporated, purchased the rubber heel, sole and cement equipment formerly operated by The Lancaster Tire & Rubber Co. The Fairfield company is now in operation and manufactures a complete line of heels and soles, but has not yet started the production of cement. F. A. Miller is president, R. A. Walkey, vice president and E. W. Ellison, secretary-treasurer.

Frank E. Church has resigned from his recent position as president of the Goodyear Rubber Co. to accept the post of director of footwear sales of The B. F. Goodrich Rubber Co., Akron, O. This position was formerly occupied by J. A. Rishel, who recently retired.

Gates Ferguson, director of advertising for The B. F. Goodrich Co., Akron, O., addressed the Advertising Club of Akron, June 19, his subject being "Pulling Advertising Out of the Clouds." He gave the club members the history of his company's recent footwear advertising campaign.

Tire price cuts, which have been expected for some time, have been announced by several tire companies, the average reduction on all classes of tires being approximately ten per cent. The first to announce these cuts, was the Firestone Tire & Rubber Co., whose reductions ranged from 4 to 17 per cent. The Lee Tire & Rubber Co. and the General Tire & Rubber Co. promptly followed with similar cuts. Kelly-Springfield announced that it would meet the reduction and it is expected that Goodyear, Goodrich, United States, Fisk and other large tire manufacturers will follow suit.

J. M. Alderfer, president of the India Tire & Rubber Co., Akron, O., has sailed for Glasgow, Scotland, to inspect the plant in course of construction there. While in Europe, Mr. Alderfer will study conditions and operations in that country.

Dr. H. L. Trumbull of the research department of The B. F. Goodrich Co., delivered an address before the Exchange club at the Elks' Club. His subject was "On Blazed Trails" and pertained to the experimental lines now followed in his work.

J. M. Linforth, manager of Goodyear truck tire sales, and **Herman Post,** manager of mechanical goods sales, have left for a two months' visit to Europe. Their itinerary includes trips to England, France, Belgium, Denmark, Germany, Spain and Holland, in each country of which they will make a survey of conditions.

H. H. Harriman has joined the advertising staff of **Tires** and will make his headquarters in Akron. Mr. Harriman takes the place of R. Foster Walker, who recently resigned.

H. S. Firestone, it is said, is sponsoring the tour of investigation which Samuel J. Record, professor of forest products in the School of Forestry of Yale University, will make. A comprehensive investigation of forest resources of the tropics, particularly of western Africa, is planned, and studies and tests of the woods will be made at the Yale laboratories.

Leading Ink Manufacturers Consolidate

The International Printing Ink Corp. represents the consolidation of a group of the leading ink manufacturers whose combined assets, it is reported, represent $13,000,000. The companies involved in the merger are the Ault & Wiborg Co. of Ohio, the Ault & Wiborg Co. of New York, the Ault & Wiborg Co. of London, The Queen City Printing Ink Co. and Philip Ruxton, Inc. The new company has been organized under the laws of Ohio, and has also acquired the entire capital stock of the In-tag Co., maker of rotogravure inks, with plants at Maspeth, L. I., and Chicago, Ill.

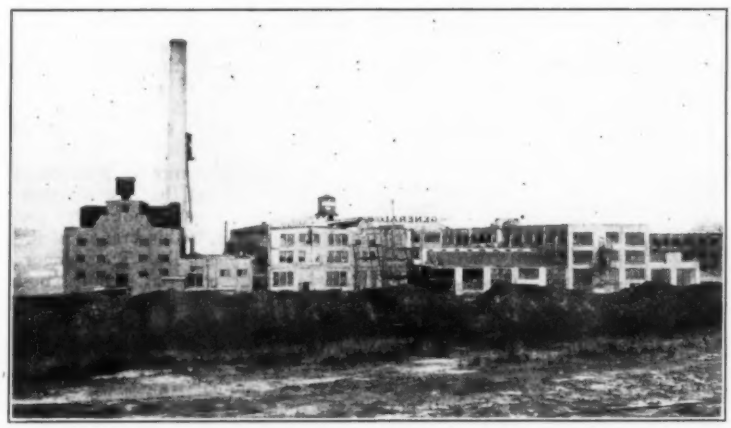
The company will be capitalized with $10,000,000 6 per cent preferred stock and 400,000 shares of no par common.

N. A. P. A. Education Chairman

C. F. Marshall, purchasing agent of the Seiberling Rubber Co. and president of the Akron Association, was appointed chairman of the National Education Committee of the N. A. P. A. Mr. Marshall's experience as instructor in purchasing at Akron University qualifies him for his new honors.

The Aetna Rubber Co., Cleveland, O., is planning the construction of new buildings at the Ashtabula plant for the floor covering division. Marbleized block, sheet rubber flooring and rubber carpet will soon be marketed. C. A. C. Kelly will be in charge of the sales of this department.

The B. F. Goodrich Co.'s plant was visited by delegates to the mechanical conference of the American Newspaper Publishers' Association which was held in Cleveland, O., the week of June 4. The inspection tour was planned by Niles & Nelson Co., Inc., who wished to show the delegation how printers' and lithographers' ink rollers are made.



View of the power house and curing department building of The General Tire & Rubber Co., Akron, O. The General company's plant covers a large industrial tract at the extreme edge of the great East Akron manufacturing district.

Firestone T. & R. Co.

NOVEL PICTURE SHOWING BEGINNING OF GUM-DIPPING PROCESS. BY THIS METHOD, EVERY FIBER OF EVERY CORD IS IMPREGNATED WITH RUBBER, TO MINIMIZE INTERNAL FRICTION AND PROMOTE GREATER ADHESIVENESS BETWEEN FABRIC AND RUBBER.

Midwest

The Charles E. Miller Rubber Works, Anderson, Ind., reports conditions as unusually favorable and prospects bright. The company is introducing a new line of electrical equipment in the way of inside arms and spot molds and the experimental department is working on electric inside molds that will carry popular prices. Charles E. Miller is president of the organization and M. E. Bale, the general manager.

The Acushnet Process Co., New Bedford, Mass., has appointed James J. Dunn, of Chicago, its representative covering Illinois, Wisconsin, Minnesota, Iowa, Missouri and part of Indiana.

The Ajax Rubber Co., Racine, Wis., has acquired control of the entire output of the Dimmick Wheel Engineering Co.

A. S. M. E. Summer Meeting

Plans for the summer meeting of the American Society of Mechanical Engineers include a vacation lake trip to precede the convention which takes place at St. Paul and Minneapolis, August 27 through 30. Two hundred members are planning to join the boat which leaves Buffalo August 20 with stops at Cleveland, Detroit, Mackinac Island, the Soo Canal, Houghton, Duluth and Winnipeg, arriving at St. Paul on Monday, August 27.

CRUDE RUBBER IMPORTS DURING JANUARY-March, 1928, were 254,149,000 pounds which is a gain of 5.8 per cent over the 240,110,000 pounds for a like period during 1927.

EXPORTS OF AUTOMOBILE TIRES DECLINED 11 per cent during the first quarter of 1928, according to *Our World Trade*.

Rhode Island

The United States Rubber Club of Rhode Island held its second meeting at the "Arcadia" in Providence, May 24, with a large attendance. This social organization is composed of the salaried male employes of the company's plants in Rhode Island and at Millville, Mass., both the manufacturing and the sales branches being represented. John W. Robertson, president of the association, introduced the speaker of the evening, Cyrus Chin, Supervisor of Industrial Relations, who called attention to the company's long record of fair dealing and the honesty of its manufactured product. He stated that the employes of the various branches and divisions of the company, including their families, numbered upwards of 200,000 persons, a population equal to that of Hartford or New Haven in Connecticut, or of Akron, Ohio. After an entertainment of five snappy four-round boxing bouts by amateurs, the entertainment was concluded with a buffet luncheon.

The United States Rubber Co. has announced that the annual vacation for the Alice and Millville mills at Woonsocket, R. I., and at Millville, Mass., will be from July 23 to August 6. These plants have been operating on a five-day week schedule during the winter. J. D. Wilmot, general manager of the Woonsocket Rubber Co., which operates the two plants, says it is the usual summer vacation and not an indication of business depression.

The Collyer Insulated Wire Co., Pawtucket, R. I., has increased its capital stock from $1,000,000 to $1,500,000, and is making extensive additions and improvements at its plant. A new river wall 460 feet in length abutting the company's property is under way and a new three-story addition to the plant on North Main St., Pawtucket, to cost $110,000 is planned by the company.

D. W. Hollingworth, who is now chemist with the Continental Fibre Co., Newark, N. J., was formerly connected with the National India Rubber Co., Bristol, R. I.

Edward H. Rathbun, of Woonsocket and a director of the American Wringer Co., was recently appointed a member of the State House Commission by Governor Case.

William F. Brown, formerly secretary to the late ex-Governor Augustus O. Bourn, is now executive secretary to Mayor Dunne of Providence.

The Phillips-Baker Rubber Co., Providence, R. I., is making extensive plant alterations, additions and improvements.

American Electrical Works, Phillipsdale, East Providence, R. I., will erect a one-story building of brick and steel construction, which is part of the extensive expansion program contemplated by this concern.

The Davol Rubber Co.'s Mutual Association held its annual dance and installation of officers recently, when the following were inducted for the ensuing year by Past President E. L. Hanna: Joseph Harris, president; Kathlee Hawes, vice president; Alfred Goff, secretary; Charles B. Bamforth, treasurer; Isabelle Lovet, Elizabeth Ryen, M. E. Bamforth, George Fisher and Leon R. Nodine, trustees.

Ernest I. Kilcup, assistant secretary and treasurer of the Davol Rubber Co., Providence, R. I. was reelected a director of the National Association of Credit Men at the annual convention held in Seattle, Wash., last month. He is a director of the Rhode Island Association of Credit Men and chairman of the executive committee. He is also secretary of the adjustment bureau of the Rhode Island Association of Credit Men.

Rhode Island Rubber Industry

According to the M. I. T. industrial survey, the main products of the rubber industry in the Metropolitan Providence district are thread and sundries, together with hard rubber, footwear, mechanical goods and golf balls. The survey included Providence, Pawtucket, Central Falls, Cranston, North and East Providence. Total value of these products during 1926 was $12,000,000. A total payroll of $3,000,000 was distributed among 1,600 men and 1,200 women, who received average earnings of $1,330 and $950 respectively, with normal capacity operations. A substantial amount of thread and sundries is consumed locally or elsewhere in New England, according to the survey. The other products are widely distributed, being handled principally through jobbers. Crude rubber, amounting to 7,000 tons annually, is shipped from New York.

The industrial inventory of five rubber concerns in the state shows 1,552 men employed at a total wage of $2,218,000 and 1,185 females at a total wage of $978,000, a total payroll of $3,196,000.

Six establishments in Providence and six in Pawtucket that manufacture elastic goods represent about fifty per cent of the volume of this branch of the rubber industry locally. The products include elastic material usually consisting of rubber thread interwoven or overwoven with cotton and silk. The employes totaled 499 of which 52 per cent were men and 48 per cent women. Average annual wages were $1,055 for the men and $940 for the women. The total payroll for the year was about $500,000.

New England

New England tire manufacturers have reduced prices conforming with the cut announced by other makers and mail order houses. For the past three months manufacturers have contended with stubborn sales resistance by dealers, who refuse to buy except on a hand-to-mouth basis in anticipation of a price cut. Now that the reduction is in effect and new insurance features are settled, sales will probably increase. Inventory losses are being carried by contingency reserves, but in some cases dividends have been passed up.

The outlook for the second part of the year is much brighter, offering an opportunity to recoup losses incurred in the earlier part of the year. Footwear business is normal and while tickets are not very heavy at present it is understood that in general orders on hand for fall delivery are larger than those booked up until this date last year. Mechanical rubber goods makers report business conditions quite satisfactory with purchases running at about the same level as last year. While prices have been reduced from 5 to 10 per cent due to the recent decline in crude the reduction is not expected to affect profits as inventories carried in most cases are not large.

Manufacturers of topping, running board mats, tubing and other rubber accessories for the automobile trade are running at peak production in order to supply these items. Rubberized cloth makers report business at an average level, with demand especially strong on lines for camp and summer use.

New England whiting manufacturers have combined with other domestic firms in petitioning the United States Tariff Commission for an increase in the import duties imposed on foreign whiting. The present duty on whiting and chalk is 25 per cent ad valorem and domestic manufacturers in an effort to meet foreign competition are endeavoring to have this increased to 50 per cent, the maximum now allowed by statute.

The United States Rubber Co.'s Naugatuck, Conn., plant will close July 23 to August 6 for the annual midsummer vacation.

J. M. Everett has been elected director of the Peavey Rubber Co. of New England, distributers of McClaren tires and tubes. Mr. Everett has for ten years been directing and managing the sales of General tires in Boston, and has acquired a wide and popular acquaintanceship with trade. As manager of the Peavey company he will continue in a similar capacity directing the commercial and retail business operations.

F. C. Hood, president of the Hood Rubber Co., Watertown, Mass., was elected to the board of directors of the recently organized Rubber Institute, Inc.

C. P. Hall Co., Akron, O., has announced the appointment of Sam Davis to direct sales activities in the Boston and Trenton districts. Mr. Hall's offices will be located at 24 Milk St., Boston, Mass.

The Acushnet Process Co., New Bedford, Mass., manufacturer of friction reclaims, has enjoyed a steady growth of business during the past year which necessitated the installation of a considerable quantity of new equipment and enlargement of the office building. P. E. Young is president.

The Boston Woven Hose & Rubber Co., Boston, Mass., has appointed A. C. Kingston assistant general manager in charge of sales, and made him a member of the board of directors. J. W. Fellows, factory manager, has also been elected to the board.

The B. F. Goodrich Co., has moved the Boston footwear division to 614 Atlantic Ave. R. J. Jones was recently put in charge of this branch.

The Hood Rubber Co., Watertown, Mass., is adding new numbers to its line of footwear, according to A. A. Glidden, development manager. A department devoted to the development and manufacture of rubber specialties of general utility has met with marked success and is now being enlarged.

The company has built an extensive factory garage for the use of officials of the organization.

The E. H. Clapp Co., Boston, Mass., reports that demand for reclaim has not decreased since the removal of restriction. E. H. Clapp is president of the company.

W. L. Montgomery & Co., 10 High St., Boston, Mass., note an increased interest in the use of Degras. Frank Briggs is president of the Montgomery company which has long been established as importers.

W. B. Wescott, research engineer of the Rubber Latex Research, Inc., Boston, Mass., recently perfected several remarkable inventions covering the application of rubber latex for many practical purposes.

John Bierer, technical superintendent of the Boston Woven Hose & Rubber Co., Boston, Mass., is advertising manager of the general program for the fall meeting of the American Chemical Society.

The Simplex Wire & Cable Co., Cambridge, Mass., is reported by Charles R. Boggs, factory manager, to be enjoying a steady demand for all its products. The company specializes in high grade cables for park lighting, building construction, high tension power distribution, etc.

James H. Stedman, president of the Stedman Products Co., South Braintree, Mass., delivered an address on rubber flooring before the Catholic Hospital Convention at Cincinnati, O., on June 19.

Francis Garvin Prize Winner

The Francis Garvin prize for 1928 in Massachusetts has been granted to David R. Cutler, Wollaston, Mass., a student of Thayer Academy, South Braintree, Mass., for his thesis entitled "Chemistry in the Rubber Industry." The author is the son of David A. Cutler, president of the Alfred Hale Rubber Co., Atlantic, Mass. His paper clearly outlines the development of the rubber industry in its principal phases and indicates the importance of chemistry in its progress.

Aeronautical Laboratory for M. I. T.

The new Daniel Guggenheim Aeronautical Laboratory at the Massachusetts Institute of Technology was formally dedicated and opened for use with appropriate exercises the afternoon of June 4. Representatives of the school, the Army, the Navy and the Department of Commerce took part, many of the guests and speakers arriving in Cambridge by airplane from various points.

The Converse Rubber Shoe Co., Malden, Mass., elected Moren L. Paterson of Chicago to the presidency of the company in place of M. M. Converse who resigned. Mr. Converse has been named chairman of the board and will act in an advisory capacity. Mr. Paterson has been acting as manager of the Western branches of the company for the past thirteen years. The plant will reopen July 2.

The National Association of Cotton Manufacturers will hold the 125th meeting of the association at the Copley-Plaza Hotel, Boston, Mass., on Oct. 24-25, 1928.

E. H. Kidder, for several years manager of the New England office of the United States Rubber Co. in Boston and later vice president and general sales manager of the Dunlop Tire & Rubber Co., has recently been elected vice president of the newly organized Boston Hupmobile Co. Mr. Kidder's new duties will comprise the management of the wholesale department.

Godfrey L. Cabot, Inc., 940 Old South Bdg., Boston, Mass., maker of carbon black, is adding to its Texas plants and will produce 28,000,000 pounds annually before the end of the year. The Cabot increase is over 14 per cent of the industry's total production, which was 198,427,000 pounds in 1927. The new construction consists of 56 burning buildings in Pampa, Texas, and 160 burning buildings in Skellytown, Texas.

EXPORTS OF RECLAIMED, SCRAP AND OLD rubber gained 66 per cent in volume during the first quarter of 1928 according to a tabulation made by *Our World Trade*.

New Jersey

Some branches of the rubber industry in New Jersey are very busy while others report that production is below normal. The announcement last month that tires and tubes would be cut 4 to 17 per cent is expected to increase sales at the present time when tires are in demand. The hard rubber business is improving gradually while sole and heel output is below normal. Tiling manufacturers report a good volume of business for this time of the year.

The Joseph Stokes Rubber Co., Trenton, N. J., announces that the hard rubber business shows some improvement over last month. The company's plant at Welland, Ontario, Canada, is operating 100 per cent capacity.

The Murray Rubber Co., Trenton, N. J., has cut the prices of tires and tubes to conform with prices of the larger manufacturers. New price lists are now being sent to the trade. The company is busy in the tire and tube departments. The window displays of the company's products in Trenton's center attracted wide attention.

Miah Marcus, treasurer of the Puritan Rubber Co., Trenton, N. J., who sailed June 6 on a two months' trip abroad, will visit the company's office at London, England, and investigate general conditions. The Puritan company is operating a day and night shift and will shortly erect another factory addition.

Frederick R. Sayen, secretary of the Mercer Rubber Co., Hamilton Square, Trenton, N. J., will sail in July for a trip of several weeks through England, France and Germany. The company is doing a fair business at this time and future prospects are encouraging.

The Lambertville Rubber Co., Lambertville, N. J., which closed its plant on January 27 last, may be started again by a Philadelphia rubber concern. It was reported that the Lambertville company would remove all machinery and equipment to the plant at Middletown, Conn. The business is now represented by the National City Bank of New York.

Gibraltor Rubber Co., Union City, N. J., will rebuild the rubber factory at West New York, N. J., which was destroyed by fire. The plant will cost $50,000.

The Combination Rubber Co., Trenton, N. J., has made a cut of 4 to 17 per cent in the prices of cord and balloon tires and tubes, which is expected to result in more business for the company.

The Luzerne Rubber Co., Trenton, N. J., finds business conditions are improving in the hard rubber field.

The Essex Rubber Co., Trenton, N. J., reports business as being a little quiet, which, officials say, is to be expected at this time of the year.

The Manhattan Rubber Mfg. Co., Passaic, N. J., has been awarded the conveyer belt contract for the conveying of the mixed concrete in the building of the cement cliff which is to be constructed on the New York side for the suspension bridge being erected to connect New Jersey and New York.

The Atlantic Products Corp. has been formed by Theodore S. Cart, former secretary and general sales manager of the Pocono Rubber Cloth Co., Trenton, N. J., which has purchased the Par-Bag golf bag business of the latter company. The Atlantic company will be merged with the Theodore S. Cart Co., manufacturer of tennis racket covers, waterproof blankets and other specialties. Mr. Cart is president of the new company, Robert C. Roebling is vice president, and Harry D. Gihon is secretary and treasurer.

The Rubber Manufacturers' Association of New Jersey held its summer meeting and dinner at the Trenton Country Club on June 5. Guests of honor included General Lincoln C. Andrews, director general of the Rubber Institute, Inc., and representatives of the Goodyear, United States, Goodrich, Manhattan, Hood and other large rubber concerns, who also represented the mechanical rubber division of the Rubber Association of America. John A. Lambert, of the Acme Rubber Mfg. Co., was chairman of the entertainment committee. Following a short business meeting, dinner was served and later the members and guests enjoyed golf.

Correct Fasteners for Rubber Galoshes

The so-called "Dot" fasteners are distinctly different in design, construction and finish from ordinary snap fasteners. They are adapted for a multiplicity of uses such as fasteners for automobile curtains, rubber footwear, bathing caps, etc. As adapted for fastening the top of a gaiter or galosh the eyelet side of the device is

The "Dot" Galosh Fastener

fashioned as a slide buckle socket and is applied to the strap of the shoe as here pictured. It is adjustable for any desired fit of the top around the ankle and is non-slipping. The Carr Fastener Co., 31 Ames St., Cambridge, Mass.

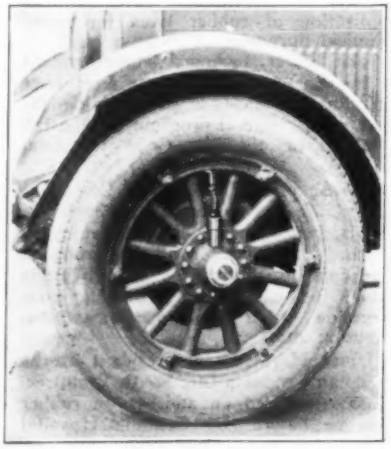
Insurance for Wage Earners

Extension of its group insurance plan now makes available to wage employes as well as salaried workers of the United States Rubber Co., insurance at a very nominal cost.

The company pays a large proportion of the total premium on the group policy.

Automatic Tire Inflator

The illustration represents an automatic tire inflator of interest to tire manufacturers and motorists generally. This device applied as pictured to an automobile wheel will automatically keep the tires inflated to a predetermined pressure and requires no adjustments or oiling. Should the tires lose air for any reason, a few miles driving brings them back to normal pressure. Proper tire inflation at all times is recognized as an economic factor in car upkeep.



Yellow Jack-It Tire Inflator

This device prevents rim cuts and broken sidewalls because it eliminates driving with flat tires. It saves the motorist loss of time at air stations and does not interfere with applying or removing a tire. The valves are set to deliver the proper amount of air to the tire and when that condition is reached no more air will enter it, but the surplus will pass off through the exhaust.—Yellow Jack-it Mfg. Co., 225 North Green St., Chicago, Ill.

Eastern and Southern

The Acushnet Process Co., New Bedford, Mass., has appointed Walter Storer, formerly of the Storer Rubber Co., Boston, Mass., sales representative north of the Mason & Dixon line, and as far west as Chicago. F. A. Burgess has been made southern representative with headquarters at New Orleans.

H. Hentz & Co., Hanover Square, New York, N. Y., has opened a Paris office at 39 Rue Cambon with Andrew B. Graves as manager of the stock department.

The Diamond Rubber Co., 1780 Broadway, New York, N. Y., a subsidiary of The B. F. Goodrich Rubber Co., announces the appointment of James A. Clark as sales representative. Mr. Clark was formerly connected with the Converse Rubber Shoe Co. and has enjoyed a wide experience in the sales and merchandising of rubber footwear.

The Roessler & Hasslacher Chemical Co., 709 Sixth Ave., New York, N. Y., recently appointed Philipp Moll assistant to manager of sales. Mr. Moll was formerly sales manager of C. H. Boehringer Sohn, Hamburg and Nieder-Ingelheim on Rhine, and more recently vice president and sales manager of Dissoway Chemical Co.

Joseph Chalfin & Co., Inc., 80 Washington St., New York, N. Y., has been dissolved and a new company, the Joseph Chalfin, Inc., formed. Offices of the company will be located at 274 Madison Ave., New York.

Goldenrod Seed Promises Rubber

Thomas A. Edison is still working on his nine acre farm at Fort Myers, Fla., hoping to find among the wild plants of the country a source of rubber. The seeds of 1,400 wild plants have been sown and so far eighty of these have been found to contain rubber. At least twelve, according to Mr. Edison, will grow on the southern cotton lands without injury by frost. Goldenrod, which grows wild and abundantly in nearly every state, has been found to be one of the best sources of rubber found among native wild plants.

H. M. Henderson Manager for Harriss, Irby & Vose

Announcement has been made of the appointment of H. M. Henderson as manager of the rubber department of Harriss, Irby & Vose, 60 Beaver St., New York, N. Y. This firm needs no introduction to the rubber trade, it is a member of all the important exchanges, including the New York Stock Exchange and the Rubber Exchange, having been a member of the latter since its inception with W. L. Harriss on its Board of Governors, and enjoys a very wide acquaintance in Europe as well as the Far East.

Mr. Henderson dates his connection with the rubber industry from 1906 when he joined the firm of Robinson & Tallman. Later he was with F. R. Henderson & Co., Inc., and for several years was in the London office of Henderson, Forbes & Co., Ltd. His most recent connection was with Henderson Bros. & Co., Inc., which firm will be liquidated.

H. H. Henderson will continue as manager of the Harriss, Irby & Vose Akron office.

National Association of Waste Material Dealers

The organization meeting of the Salvage Division of the National Association of Waste Material Dealers, Inc., was held at the plant of the duPont company at Wilmington, Delaware, June 6 and 7.

The B. F. Goodrich Co., has moved its New York footwear division to 50 Thomas St. I. B. Wells continues in charge.

H. W. French Co., Inc., 347 Madison Ave., New York, N. Y., crude rubber broker, has been named exclusive American agent for Corrie MacCall & Sons, Ltd., of London. Harold French and R. S. Baldwin, vice president of the French company, have just returned from a trip abroad during which the negotiations were completed.

The John Robertson Co., 121 Water St., Brooklyn, N. Y., has elected Norman F. Robertson president of the company to succeed his father, the late N. A. Robertson. Allan R. Hardie, treasurer of the company, has now been made secretary and treasurer.

John H. McFarlin who for the past five years has been with the J. P. Devine Co. is now serving as sales engineer for the H. G. Trout Co., Buffalo, N. Y., manufacturer of chemical machinery.

The Mohawk Rubber Co. recently moved its New York branch office to 16 W. 61 St.

The J. P. Devine Co., Buffalo, N. Y., which has become associated with the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., has changed its corporate name to the J. P. Devine Mfg. Co. The organization will manufacture the apparatus which the Devine company has built for the past twenty-three years: driers, evaporators, impregnators, chemical and sugar apparatus.

The personnel of the new company includes Walter C. Arthurs, chairman of the board; Joseph P. Devine, president; H. H. Cust and C. P. Devine, vice presidents; C. W. Reynolds, secretary; and D. P. Settlemire, treasurer.

F. A. Seiberling, president of the Seiberling Rubber Co., attended the ceremonies incident to the dedication of the Duke Hall of Citizenship held in Cumberland Gap, Tenn., June 3. Mr. Seiberling, in his capacity as chairman of the board of trustees of the Lincoln Memorial University, accepted the hall, which is a gift to the university from Benjamin Duke.

United States Rubber Co., has assumed direct control of the management and operation of the Winnsboro Mills which manufacture the cord used in the U. S. tires. Lockwood, Greene & Co. had been the managers since 1917, but are now discontinuing their management department. C. B. Seger is the new president of the mills and A. E. Jury has been appointed acting agent at Winnsboro.

George Schworm on Staff of India Rubber World

A recent addition to the staff of INDIA RUBBER WORLD, George S. Schworm is affiliated with the advertising department with headquarters in New York. He comes to us from the Lorain Journal, of which paper he was assistant advertising manager, and, with his experience in the rubber and advertising fields, is well equipped for his new post.

A native of Ohio, Mr. Schworm was born in Massillon where he received his early education, which was completed in the University of Akron. His first position was with the tire division of the Diamond Rubber Co., going from there to the Goodyear experimental department, later being transferred to the mechanical goods factory and sales division. He then became the representative of two New York rubber brokers. His next connection was as a tire salesman for the Mason Rubber Co.'s Cleveland branch until he was made manager of the merchandising service department of the Evening Repository, Canton, O.

Mr. Schworm is a member of the Lone Star fraternity, and served his country during the World War as a member of the Chemical Warfare Service.

Airview of the Pacific Goodrich Rubber Co.'s new factory at Los Angeles, Calif.

Pacific Coast

Firestone Tire & Rubber Co. of California has not yet set a date for the official opening of its Los Angeles plant on account of the delayed street improvement; but it is stated that it will certainly take place early in August. The building schedule is over 90 per cent complete, and the remainder, which involves chiefly the administration building, will be wholly cleared up by July 15. The concrete for the latter structure was poured late in June. Fully 95 per cent of the machinery has been installed and a large volume of crude materials has been warehoused. Some tire making has already been done but quantity production will not be undertaken until early in July. A neighborhood bank and a boulevard already bear the Firestone title, and considerable house building is under way. The Southern California Edison Co. has established a substation for the exclusive use of the Firestone plant.

Dr. David Spence, vice president and chief chemist of the Intercontinental Rubber Co., who has been spending several months at the company's main plant at Torreon, Mexico, will next month visit the guayule experimental station of the subsidiary company, American Rubber Producers, Inc., Salinas, Calif.

Rubber Corporation of America, Russ Bldg., San Francisco, Calif., has taken over the plant and business of the Keaton Tire & Rubber Co., 17th and Kansas streets, San Francisco, and expects to have it again in operation by August 1. The president of the new concern is A. L. Clark, vice president of the American Brakeshoe & Foundry Co. and the vice president and general manager is W. Flanders Satchel. R. H. Keaton, president of the old company formed in 1911 and who had been chosen secretary of the new corporation, has resigned. A new secretary and a treasurer will, it is said, be selected soon.

C. U. Martin, rubber broker, representing E. A. Barber Ltd., of Singapore, 116 New Montgomery St., San Francisco, Calif., is arranging to carry crude stocks at a local warehouse. Mr. Martin, who will start this month on a visit to the leading rubber markets in Europe, has established a Los Angeles branch at 1004 Builders' Exchange with Francisco Minoprio in charge.

The Goodyear Tire & Rubber Co., of California, Los Angeles, Calif., reports that Edwin J. Thomas, former assistant to President Paul W. Litchfield at the Goodyear works in Akron, and who changes places with Harry E. Blythe, of Los Angeles, has taken up his duties as general superintendent of the California factory. Production shows no sign of letting up, having for two months been close to 10,000 tires and somewhat more tubes daily. The newest feature at the plant is the making of the Double Eagle tire, a super casing originating in Akron to commemorate the 30th anniversary of the Goodyear company. During the past month the Los Angeles plant has been obliged to increase its supply of molds for the new tire four times. Traffic Manager C. W. Case states that Los Angeles made tires and tubes are being shipped not only to the nineteen western distributing points but also to many eastern and southern cities, as well as to ports in the Orient and on the west coast of South America. The erection of three large additions to the Los Angeles plant will be made, it is said, in the near future. President John W. Mapel returned last week from an extensive business trip in the Northwest.

Pioneer Rubber Mills of San Francisco is said to have the most complete and efficient molded garden hose unit in the world at its works in Pittsburg, Contra Costa county, Calif. The plant has capacity for making by continuous process (a company patent) over 15,000,000 feet a year and is now turning out on 24-hour daily schedule in excess of 12,000,000 feet yearly. Not only are sales made in nearly every state, but a large quantity is marketed in Europe and in the Far East. Other big products are heavy transmission and conveyer belting and cross expansion piston rod packing. The company also has one of the most efficient reclaiming plants in the country and is reported to have recently negotiated a large contract for supplying the reclaim required for a long period by a big European rubber works. The company's personnel seldom changes, most of the officers and factory executives having been with the concern 25 years and more.

Pacific Goodrich Rubber Co. is daily stepping up production at its new Los Angeles plant and adding steadily to its working force, so that carloads of tires and tubes are being shipped daily to its Pacific Coast branches. The company's advertising has been featuring the fact that Goodrich Silvertown tires were part of the equipment of the airplane Southern Cross which made the flight from California to Australia. It is not improbable in the near future that footwear as well as tires and tubes will be manufactured at the Los Angeles plant. An intimation to this effect was given by President Tew of the parent B. F. Goodrich plant of Akron on his last visit, he admitting that the company had been considering the advisability of pioneering with such products on the Coast and citing the fact that Los Angeles harbor employs more fishermen than Boston and that no section uses more tennis shoes than California.

Guayule in California Botanic Garden

Fine specimens of the newly cultivated guayule plant have been set out in the California Botanic Garden in Mandeville Canyon, Santa Monica Mountains, near Los Angeles, Calif., according to Dr. E. D. Merrill, director general of the 1,000-acre project. In the picture the doctor is seen

Specimens of the New Guayule Plant

seated; and standing alongside is Managing Director Frederic W. Taylor of the Garden, explaining the habits of the plant to Dr. Merrill. Mr. Taylor is also vice president of American Rubber Producers, Inc., which is introducing guayule culture on a large scale at Salinas, Calif. He was formerly head of the Department of Agriculture in the Republic of San Salvador, managed a large cotton plantation in Arizona, and is an authority on subtropical horticulture.

The Firestone Tire & Rubber Co., of California's personnel includes the following: R. J. Cope, sales manager; C. A. Myers, vice president of the parent company, director of engineering; N. H. Myers, chief engineer; C. P. Firestone, traffic manager; W. K. Brown, tire division superintendent; T. E. Pittenger, factory superintendent; C. A. Sutton, purchasing agent; W. K. Smith, safety director; J. P. Patterson, sales department; J. A. Meek, employment department; and C. Uschman, master mechanic. Mr. Cope has been visiting the Firestone branches in the western states served by the new factory.

Frank A. Seiberling, president of the Seiberling Tire & Rubber Co., Akron, O., has been a recent visitor in Los Angeles, where in 1919 he bought the site for the California Goodyear plant. He stated that his company had no intention of building a branch factory on the Pacific Coast.

R. E. Baskerville, Philippine representative of the Firestone Tire & Rubber Co., Akron, O., arrived in Los Angeles from Manila June 18. With Mrs. Baskerville he will visit his old home in Detroit.

American Rubber Manufacturing Co. of San Francisco has for several months been running two shifts daily in trying to overtake orders for heavy belting, and is also doing a large business in heavy hose and general mechanicals. A feature which is going especially well is the circular woven tire vulcanizing sandbag invented by President N. S. Dodge, who recently made a southwest business trip.

Pacific Coast Mechanical Rubbermen's Association has again chosen Milton S. Sprague, vice president of the Plant Rubber & Asbestos Co., San Francisco, as president, succeeding W. A. Corder, president of the Los Angeles Rubber & Asbestos Co. Last fall the association had its annual golf tournament in Los Angeles, and a committee in charge will soon announce the place and date of the next one.

United States Rubber Co. finds business showing a gratifying improvement throughout its entire far west territory. The recent country-wide reduction in tire prices has had a marked effect in stimulating sales, prospective buyers now realizing that there is no excuse for further hesitancy and that the chances for further recession in prices are most remote. An excellent demand is noted for general mechanicals, and among purchasers of oil field rubber goods a decided tendency is noted toward the buying of quality products, even at a somewhat higher price. Cheap goods, purchasing agents admit, are not economical in the long run and time taken for replacements is often valuable. The most notable gain made by the company has been in rubber footwear, the Pacific Coast Division having already run far ahead of the quota set for it for 1928.

American Rubber Products Co., of which A. Shurberg is manager, has moved from 1375 W. Jefferson St. to larger quarters at 1702 S. San Pedro St., Los Angeles, Calif. The concern, which has installed a lot of up-to-date equipment, manufactures a superior line of tire boots and reliners and reports a steadily expanding business.

The Pacific Goodrich Rubber Co.'s executives, S. B. Robertson, vice president and general manager, and F. E. Titus, general sales manager, left on June 16 on an eastern trip. After a short stay in Salt Lake City, Mr. Robertson went to Akron and Mr. Titus to New York to visit his family, who will return to Los Angeles with him. At Akron they will be joined by Miss Jane Robertson, who will also make her home with her parents in the southwestern city.

Universal Rubber Manufacturing Co., 938-958 Harrison St., San Francisco, Calif., according to President George M. Stevens, is doing exceptionally well in making a large assortment of general mechanical rubber goods, including special sizes of heavy belting, wrapped hose for railroad and steamship use, printers' rolls, papermakers' supplies, rubber linings for acid and alkali tanks, and various newly patented rubber specialties.

The Buffalo Foundry & Machine Co. has opened a San Francisco office with C. O. Lovett in charge.

Earl L. Davies has been made vice president in charge of manufacturing of the Samson Tire & Rubber Co., Los Angeles, Calif. Mr. Davies has been factory manager for the company for the past five years.

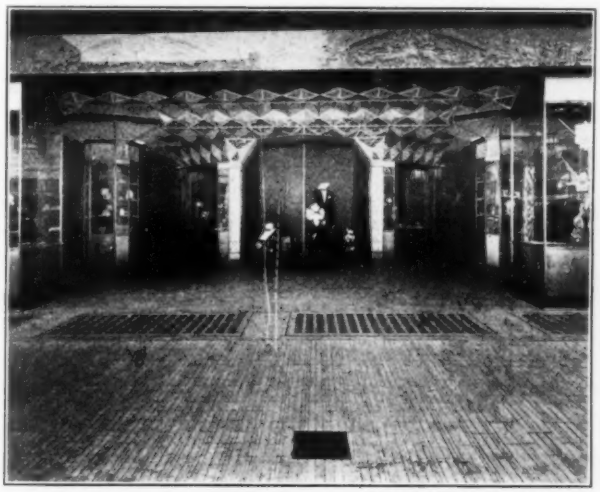
Chanslor & Lyon Tire & Rubber Co., Oakland, Calif., conducted by the Chanslor & Lyon Co. which operates a chain of automobile accessories stores on the Pacific Coast, reports that business is very good. A new line, radiator hose, is running particularly strong. The factory is in charge of Harry G. Blanchard, a veteran rubber man.

The American Rubber Producers, Inc., of Salinas, Calif., recently conducted at Pomona College, Claremont, Calif., a motion picture exhibition showing the collection and extraction of rubber from guayule shrubs in Mexico and the new method of cultivating guayule at the Salinas experimental station.

D. W. Warden, vice president in charge of sales, of the Dayton Rubber Manufacturing Co., Dayton, O., recently finished a business trip on the Pacific Coast.

J. A. Holland, representing the James C. Heintz Co., makers of electric vulcanizing equipment, Cleveland, O., has been making an extensive and successful business tour in the Southwest.

California Rubber Products Corp., Merchants' Exchange Building, San Francisco, Calif., Arthur L. Shannon agent in charge, completed its building at Redwood City, 25 miles south of San Francisco and began the manufacturing of balata and gutta percha golf ball cover stock. W. A. Cree is president, James Whiting vice president, H. J. Raynes secretary and treasurer, and E. C. Huyck in charge of refining and manufacturing.



Rubber Sidewalk in front of the James Oviatt Building in Los Angeles. Laid by Wright Rubber Products Co., Racine, Wis.

Harvey S. Firestone and Three Sons Feted by Los Angeles Commercial Leaders

The Los Angeles Chamber of Commerce on June 19, gave a luncheon at the Biltmore Hotel in honor of President Harvey S. Firestone and three of his sons, Harvey, Jr., Russell and Leonard, many prominent business men of the city also being guests. Mr. Firestone, Sr., had come direct from Kansas City, where he had attended the Republican national convention. His son, Russell, will remain in Los Angeles as chief executive of the new plant.

A tire built by Harvey S. Firestone, Sr., at the Los Angeles factory, and still warm from the mold, was brought to the speakers' table and evoked much applause. George L. Eastman, president of the Chamber of Commerce introduced the senior Firestone who was given an ovation that attested to his popularity.

Mr. Firestone declared that Los Angeles was ideally located for rubber manufacturing and distribution, and was confident that the establishment of the new tire plant there would prove one of the best moves his company had yet made. He also announced that adjoining the plant would be built a branch factory of the Xylos Rubber Co., of Akron, a Firestone subsidiary, for reclaiming rubber. It will have a daily capacity of 100,000 pounds, but present equipment will limit output to 50,000 pounds daily. Such output as may not be needed by the tire plant for cheaper casings will be marketed in the territory between California and Missouri.

On the Pacific Coast, Mr. Firestone said, old tires may be bought as low as $10 a ton as compared with as high as $20 farther east. Freight from the Coast to Akron costs $15, but a rubber reclaiming industry on the Coast can by buying cheaper and saving freight sell its product at a decided saving to rubber manufacturers.

Samson Tire & Rubber Corp., Los Angeles, Calif., reports that the reaction of dealers to the recent general price recession on tires has been most favorable, and has been strikingly evidenced in the size and number of distributers' orders. The timid hand-to-mouth buying has given way to confident, considerable purchasing. All lines are running strong, and the company is fairly swamped with truck tire orders. The original factory at Compton has for a long time been running three shifts a day despite several enlargements of the plant, and the No. 2 plant in San Diego, which is of very large capacity, shows a continual stepping up in factory production.

Columbia Tire Corp., Portland, Ore., which has been taken over by the new C. T. C. Tire & Rubber Co. is ready to resume production after effecting an amicable settlement of its financial difficulties. Not only tires but general mechanical rubber goods will be made by the new concern according to J. F. Cullen, president and general manager, and who was engineer and manufacturing manager of the old company. It is stated that the plant and equipment of the old company were taken over for about $250,000. The new concern has a capital of $300,000 and fixed assets of $425,000.

Rubber Imports

Rubber imports from the Far East through the port of Los Angeles for 1927 are reported as having been little more than 10,000 tons, or scarcely 2 per cent of the total of 480,000 tons brought into the entire country. A very decided increase in the direct shipments of crude through the southwestern port is expected, however, for the current year, owing not only to the opening of the Goodrich and Firestone factories but also to a very considerable increase in production at the Goodyear, Samson, and other rubber mills.

RUBBER FOOTWEAR EXPORTED DURING January-March, 1928, shows a 17.3 per cent gain over a like period in 1927.

Tire Tread Testing Apparatus

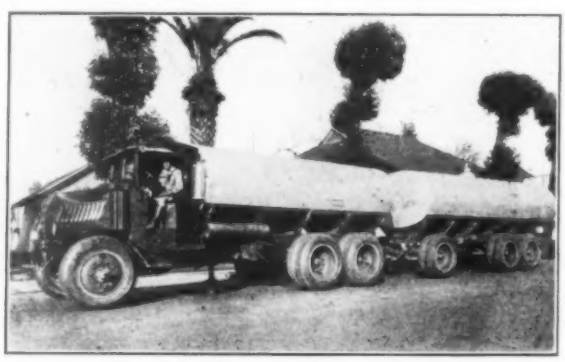
A device has been built at the Bureau of Standards, Washington, D. C., for observing the flexing of tire treads through a heavy plate glass. The results of tests made with this apparatus, as well as the results obtained by another method which proved to be a satisfactory one for obtaining similar data will be published later. With this latter method a piece of sheet metal is given a thin coating of soft wax and is then sprinkled sparingly with grains of carborundum. A tire under the desired load and air pressure is rolled over the waxed plate, the carborundum grains stick to the tire and each traces on the plate the movement of the particular point on the tire to which it happens to stick. Some very interesting information concerning tread movements was obtained in this way.

Veneer Cases

Estate rubber produced in Sumatra is largely shipped in veneer cases which usually contain about 100 kilos of rubber in sheets or 80 kilos of crepe rubber. Outside measurements of standard cases used are 19 by 19 by 24 inches with the four sides, top and bottom made of single boards of three ply veneer. Each ply is 1/16 of an inch thick, which makes the total thickness of board, plus glue, 3/16 of an inch.

World Engineering Congress

An important event in the engineering and industrial world is the forthcoming World Engineering Congress which will be held at Tokio in October, 1929. Engineering societies throughout the world are planning to be represented and from present indications it appears that this country will send a delegation of notable engineers. An American committee has been formed, of which Herbert Hoover has been made honorary chairman, with offices located at 29 W. 39 St., New York, N. Y. Maurice Holland is executive secretary.



The Twentieth Century gasoline tank car, one of a fleet operated by the Oilfields Trucking Co., Taft, Calif., and equipped with 40 by 8 General pneumatic tires.

Prof. Whitby Honored

The French Government has conferred upon Prof. G. S. Whitby, McGill University, Montreal, the distinction of "Officier d'Académie," for services in the field of science. The award is the first grade of the decoration "Officier de l'Instruction Publique." He is well known for his rubber researches.

Prof. Whitby was recently elected the first President of the Canadian Chemical Association. This association, which will embrace all local chemical organizations in Canada, was formed at the Eleventh

Prof. G. S. Whitby

Annual Dominion Chemical Convention held at London, Ontario, June 6-8, 1928.

Prof. Whitby for several years past has taken an important part in scientific activities in the province of Quebec and in the Dominion generally. He holds degrees from McGill University, is a Fellow of the Royal Society of Canada and past president of the Canadian Institute of Chemistry.

Colloid Symposium

At the Sixth Colloid Symposium held at the University of Toronto, June 14 to 16, papers pertaining to researches in rubber chemistry were read by Dr. G. S. Whitby, Dr. Ernst A. Hauser and Dr. H. F. Trumbull.

Dr. Whitby described researches conducted at McGill on artificial products possessing elastic properties comparable with those of rubber. These researches will contribute to an understanding of the cause of elasticity in rubber.

Dr. Ernst Hauser showed a new technique by which it is possible to follow under the microscope the changes taking place in rubber during vulcanization. Dr. Hauser will visit the department of chemistry at McGill University because of his interest in the researches on rubber which are being carried out there.

Dr. H. F. Trumbull showed how it has been possible to make from raw rubber emulsions which are similar to natural rubber milk.

CAPITAL INVESTED IN RUBBER INDUSTRY in Canada including footwear is $65,562,734. Cost of materials is $38,389,352 and value of products is $78,229,574.

Canada

Col. A. E. Massie, manager of the Dominion Rubber Co., (Maritime) Ltd., states that no recent change in the prices of footwear has been made, but values are slightly higher and steadier than a year ago. "No one," he said, "needs to cut prices to get business today, and the trade is willing to make what purchases they need for the future. Fall bookings were better than in several years due to the strong market condition and improved industrial conditions in the Maritime provinces. Present prices are likely to hold firm until the end of the calendar year. Merchants who placed orders prior to May 1 did well and stocks so bought should show a good profit. There is not much activity in footwear now, which is expected, as tires, tubes, etc., are the commodities in which dealers are most interested at this season."

The long dry spell has helped sales of garden hose. There is no change in prices.

No reduction in Canadian tire prices has taken place at this writing, but it is rumored that Canadian buyers can look for a lower priced product later on. There are raw materials purchased at higher prices still to be processed, and retailers must be protected against loss.

Dominion Rubber Co., Ltd., is using large sized copy featuring Fleetfoot sport shoes and the various types of Dominion tires.

Goodyear Tire & Rubber Co. of Canada, Ltd., reports that this year's production to date has been the largest for any similar period on record. The company has operated at full capacity 24 hours a day, turning out nearly 9,000 tires and 9,000 tubes daily.

Canadian General Rubber Co., Ltd., Galt, Ont., is not a subsidiary of Hayes Wheels, Ltd. & Forgings, Ltd., Chatham, Ont., as reported last month. This company is the outgrowth of the Transparent Rubber Goods Co., Ltd., Toronto, Ont., whose plant and equipment was moved to Galt. The directors of the company comprise E. Barringham, president, who is also general manager and a director; W. Kistler, vice president, also director; C. T. Black, secretary-treasurer; W. R. Peck, comptroller. Directors: James V. Clark, Hon. J. D. Chaplin, C. G. McGhie, J. J. Moriarty, and J. H. Ratcliffe.

Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., recently opened a $600,000 plant addition comprising 55,000 square feet of floor space. To mark the occasion the company entertained at luncheon the Mayor, Board of Control and about 100 leading business men of Hamilton. This new wing provides facilities for an increased production of 40 per cent, or 5,000 tires a day.

W. H. Miner, president of Granby Rubber Co., Ltd., Granby, Que., was elected chairman of the Education Committee of the Canadian Mfgrs'. Association at its recent annual meeting. Mr. Miner was also a member of the Reception and Entertainment Committee.

W. E. Snelling, retired as manager of the Toronto branch of Ames Holden McCready Rubber Co., Ltd., after 18 years' service, is succeeded by Frank Cartan who has been associated with the firm covering Eastern Ontario territory for the past eight or nine years.

Dunlop Tire & Rubber Goods Co., Ltd., has recently erected a handsome electric sign on the top of the Montreal branch building which gives excellent publicity to the premises and to Dunlop tires.

John Westren, general manager of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., will represent the Canadian Mfgrs'. Association at the Canadian National Exhibition.

R. R. Maculay, Miner Rubber Co., Ltd., Montreal, is a member of the Municipal Affairs Committee, Quebec Division, Canadian Mfgs'. Association. He also serves on the executive committee of this body.

L. V. Sicotte of the Goodyear Cotton Co. of Canada, Ltd., has been elected Honorary Secretary of the St. Hyacinthe, Quebec, branch of the Canadian Manufacturers' Association.

Rubber Specialty Co., Ltd., is a new firm incorporated in Quebec province with a capital of $20,000 and offices at Montreal.

Somer Rubber Products, Ltd., Toronto, Ont., has incorporated with a capital of $50,000 to deal in rubber goods or its substitutes.

Rubber Goods Factory for Shanghai

An American company, incorporated under the China Trade Act, to be known as the Oriental Rubber Corp., is to be established in Shanghai. The manufactures will consist of footwear, heels, soles, hot water bottles, rickshaw tires and other products. The personnel will include W. S. Leonard, president; U. S. Harkson, vice president and treasurer; Frank M. Chu, secretary and sales manager; and O. T. Chang, factory manager.

Italian Industry

The Italian rubber industry is concentrated in Lombardy and, although many establishments are engaged in the manufacture of rubber products, only about five enter seriously into the export field—Pirelli, Hutchinson, Martiny, Bergougnan & Tedeschi, and Michelin.

Obituary

Prominent Machinery Manufacturer

Norman A. Robertson, president of the John Robertson Co., 133 Water St., Brooklyn, N. Y., hydraulic press manufacturer, died May 24, 1928, at his summer home at Spring Lake, N. J., after a short illness.

Born in Brooklyn in 1870, he was the son of the late John Robertson, who founded the company bearing his name. He was graduated from the Brooklyn Polytechnic Institute and at once entered the employ of the company with which he was associated for forty years.

Mr. Robertson was well known in the electrical cable, rubber hose, blue lead and metal working industries, for which he developed and built much special machinery. He was a member of the Montauk Club, Crescent Athletic Club, Engineers Club, Machinery Club, Altair Lodge, F. & A. M. and Kismet Temple Order of Mystic Shrine.

He is survived by his wife, Mrs. Jenny Finch Robertson; a daughter, Mrs. Ethel R. Dowling; a son, Norman F. Robertson; a sister, Miss Anna M. Robertson and a brother, Dr. Victor A. Robertson.

Passing of Well-Known Rubber Executive

The death on May 16 of W. W. Wuchter, while on a vacation trip with Mrs. Wuchter to Cuyahoga Falls, O., removes an executive long connected with the rubber industry. He is survived by his widow and one daughter.

Mr. Wuchter was born in 1872 in the town of Western Star, O., receiving his education in the public schools of Akron. He entered the employ of The B. F. Goodrich Co. as tiremaker, advancing to the position of foreman. On leaving this firm, he went as foreman to the Firestone Tire & Rubber Co., Akron, and later was made superintendent. In 1909 he took over the management of the Swinehart Tire & Rubber Co. and developed the business from a comparatively insignificant volume to an important output. He joined the Gibney Tire & Rubber Co., Conshohocken, Pa., as its manager in 1912, leaving in 1915 to become second vice president and manager of works of the Kansas City Tire & Rubber Corp., Chester, W. Va. He then joined the Nebraska Tire & Rubber Co., Inc., Omaha, Neb., as its president, but was forced to resign in 1924 because of ill-health. After a rest of several months, he acted as sales manager of the Studebaker-Wulff Rubber Co., Marion, O., making his headquarters at Omaha and devoting his attention to developing the sales territory west of the Mississippi.

Mr. Wuchter was a Mason and a member of the Society of Automotive Engineers. During 1921-22 he was president of the Mid-West Manufacturers' Association.

W. W. Wuchter

In recent years Mr. Wuchter made his home in San Carlos, Calif. Burial was in Akron, O.

Miller Official Succumbs to Heart Attack

William J. Slater, for the past three years manager of the southern sales division of The Miller Rubber Co., died suddenly of heart disease at the Miller hospital, on Tuesday, June 5. He is survived by his widow and a daughter, Mrs. Evan Williams, Jr., of Akron, O.

W. J. Slater

Mr. Slater's business career began in the circulation department of a newspaper, of which he eventually became manager and part owner. Later he was made advertising and sales promotion manager of the Firestone Tire & Rubber Co. From that position he went to the Williams Machine Co., Akron, where he was sales manager, secretary and assistant treasurer.

His connection with Miller began as special representative in the southern division with headquarters at Atlanta. Within a few months he was made assistant manager of the southern division and three years ago assumed full charge of that division.

Well liked by his business associates, Mr. Slater was a tireless worker, held in high esteem by all his subordinates.

William W. Major

Actively engaged in the manufacture of tire repairs and accessories for the past twenty years, William W. Major, who passed away in Midlothian, Texas, April 23, 1928, was a patentee and inventor of several types of blowout patches. He was president of The 20th Century Mfg. Co. of Midlothian since 1907 and had also acted as president of the National Rubber Filler Co. since 1913.

Mr. Major was born in Oneonta, Ala., Oct. 22, 1858, in the public schools of which town he received his education. He was a member of the K. of P. Lodge, Elks, and a trustee and president of the Board of Stewards, M. E. Church South for many years.

Tool Manufacturer

John Sandberg, a partner of the Brockton Tool Co., Brockton, Mass., met his death by drowning May 13, 1928, at Moosehead Lake in Maine. He is survived by his wife and son, John, Jr.

Mr. Sandberg was born in Sweden, October 12, 1879, and started his business career in this country as a tool maker for Frank Mossberg Co., Attleboro, Mass. He was for a time connected with the Tuck Mfg. Co., Brockton, until he formed a partnership, August 1, 1912, with Levi Holmes under the name of the Brockton Tool Co., since which time they specialized in the manufacture of rubber heel and sole molds.

A member of the Kiwanis Club, a 32d degree Mason, and associated with various local Swedish organizations, Mr. Sandberg's kindly disposition and pleasant personality gained for him a host of friends.

Mexican Guayule Operations Suspended

Because of the removal of restriction, guayule operations in Mexico will be abandoned for the present. Production costs of guayule rubber make it impossible to compete with tree rubber under normal conditions, and efforts are now being directed to find some cheaper method of extracting from the shrub, which, if successful, will result in the restoration of the industry on a much larger scale.

Officials of the Continental Rubber Co., it is stated, have ordered its $5,000,000 rubber factory at Torreon closed down, and its three other plants, located in the states of Zacatecas and San Luis Potosi, to cease operations as soon as they finish with the stocks of guayule shrubs now on hand.

The Rubber Industry in Europe

Great Britain

Rubber Paving

It has repeatedly been asserted that the only real and permanent cure for slumps in the rubber industry is increased consumption of rubber; that is, increased to the point where all rubber produced will be used for everyday purposes. The highly remunerative prices which rubber was obtaining in 1925 and partly in 1926 rather slackened the interest in new uses for rubber, but now that restriction is to be removed the matter is being seriously taken up again. The sharpening of wits brought about by the previous slump resulted in various attempts to solve the problem of rubber paving since it was recognized that here was a field in which huge quantities of rubber could be used.

The Gaisman block was one of the most successful rubber blocks devised, and in 1923 the Universal Rubber Paviors, Ltd., was formed to carry out further experimental work in connection with rubber paving. It was this company which manufactured the blocks for New Bridge St., London, besides the white line blocks constructed on the same principle and in use in forty to fifty English towns. This experimental company has now been wound up and a new concern, also to be known as Universal Rubber Paviors, Ltd., has been formed to carry on the work of the older organization on a larger scale.

The new undertaking will have the support of a strong consultative committee consisting of members of the rubber planting industry, and every effort will be made to overcome the difficulties in the way of a more universal use of rubber for paving and to put rubber paving on a sound foundation.

At present this is the only company formed to undertake this particular work, and it is hoped that many more will be formed, which is essential if rubber roadways are to be established over wide areas.

The prospectus of the company is being issued to the 230,000 shareholders on the collated index of the Rubber Growers' Association, and it is expected that they will seize the opportunity to support an undertaking which would aid in safeguarding their interests.

Company Developments

As might have been expected, the imminence of the abolition of restriction has stimulated interest in amalgamations again. The first important fusion reported since Mr. Baldwin's announcement is that of the Merlimau Rubber Estates, Ltd., and Pegoh, Ltd., which automatically includes the Consolidated Eastern Plantations, Ltd. These estates are all in Malaya and the new combine will have a joint area of 20,758 acres, of which 17,818 acres have already been planted up. To carry into effect the scheme of amalgamation, it was resolved at a recent meeting of Merlimau to increase the company's capital to 1,000,000 pounds by the issue of 5,000,000 new shares of 2 shillings each. At the same time the name of the company will be changed to Merlimau Pegoh, Ltd., and Sir Ernest Birch will be president.

It is further understood that the Mooply Valley Rubber Co. and the Malayalam Plantations, Ltd., a mixed tea and rubber plantation, plan to merge. These concerns are both in South India and when combined will have control of 69,965 acres, of which slightly less than half is planted (15,029 acres with rubber and 17,353 acres with tea). In addition, it is noted that at a recent meeting of the Selaba Rubber Estates it was stated that the board is considering the question as to whether the company should merge itself in some larger combination or not. The company owns two estates with 3,800 acres of rubber and reports satisfactory results over 1927.

The Industrial Rubber Manufacturers, Ltd., was registered on May 8 with a nominal capital of 150,000 pounds in 250,000 preference shares of 10 shillings each and 500,000 ordinary shares of 1 shilling each. The objects are to adopt an agreement with Industrial Rubber Products, Ltd., and to carry on the business of manufacturers of rubber and tires, industrial, mechanical and other rubber goods; rubber merchants, exporters and importers of rubber, tires and other industrial surgical and scientific rubber goods and appliances, etc.

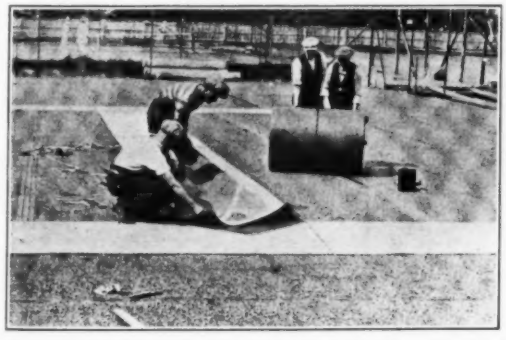
The first directors are Lord Erskine of Restormel, Spratton Hall, Northampton; H. Munro, managing director of Imperial Property Investment Co., Ltd.; E. D. Burley and W. H. Patrick, respectively managing director and director, Industrial Rubber Products, Ltd., and Colonel F. B. Buist, 46 Pall Mall, London, S. W. 1. The registered office is at 191-192, Tottenham Court Rd., London W. 1.

To assist in the development of the concern, the freehold factory known as the Werneth Mills, Burton-on-Trent, will be acquired.

The shareholders of Federated Rubber Growers & Manufacturers, Ltd., have passed a resolution to wind up the company. They approved the distribution among themselves of the shares which the concern holds in George Spencer Moulton & Co. The board of the latter firm will consist of directors of Federated Rubber Growers together with R. C. Irwin and T. L. Taylor. The company to be wound up was formed in 1919 with an authorized capital of 2,000,000 pounds, of which 1,662,921 pounds has been issued, and has not been a success. Recently it disposed of the Wood-Milne business which had been unprofitable for years, as well as of its interest in the South African Rubber Manufacturing Co., while the tire department of George Spencer Moulton & Co. was transferred to a new company. The main business of George Spencer Moulton & Co., has been a successful investment for Federated Rubber Growers, and it was felt that there was no longer any need for the holding company to continue as a separate concern.

Institution of the Rubber Industry

At a meeting of the General Council of the Institution of the Rubber Industry, held on May 18, the following were elected to diploma membership: Fellows: F. W. Bennett, John M. Bierer, Professor G. Bruni, J. K. Burbridge, F. I. C., F. Fellowes, Dr. W. C. Geer, S. C. Mote, C. A. Proctor, Dr. A. A. Somerville, D. G. Snodgrass, M.Sc., Dr. David Spence, H. K. Turner, Professor G. Stafford Whitby. Associateship (Science).—F. S. Mahn, L. R. Nicholson, I. H. Robinson, B.Sc. (Tech.). Associateship (Engineering).—F. H. Amende, F. C. Jennings. Associateship (General Rubber Technology).—W. J. Leonard.



Rubbercort for tennis perfected by Many Inventions, Ltd., 3 Queen Victoria St., London, E.C. 4, England.

Post-Restriction Conditions

Naturally, recent company reports all touch on the removal of restriction and the new policy to be adopted. Most companies seem to plan to reach full production by November 1, 1928, and quite a few hold important stocks of surplus rubber on the estates. Thus the Scottish Malay Rubber Co. reports 150,000 pounds of surplus rubber on estates. Merlimau will accumulate a considerable stock on the estate which will be sold for delivery during November—March next. Kepong Rubber estimates that the estate will have a surplus of 500,000 pounds of rubber in hand on November 1 over and above the exportable allowance to that date. All reports mention the need for economy on estates, and if present prices continue for much longer it is to be expected that in many cases economizing will mean omitting some of the work in connection with upkeep of estates.

Germany

Crude Rubber

German consumption of crude rubber which had increased notably in 1927, showed a decline for the first quarter of 1928 as compared with the corresponding quarter the year before. Total imports over the period in question were 105,123 quintals against 96,668 quintals in 1927, but reexports were 13,777 in 1928 as compared with 4,627 quintals in the preceding year, so that actual consumption was 91,346 quintals against 92,041 quintals. At the same time it is interesting to note that imports of waste and old rubber were more than two and a-half times those of 1927. Arrivals of gutta-percha declined from 724 quintals to 562 quintals, and balata increased from 1,673 to 1,775 quintals.

American Tires Lead

The unwelcome invasion of the German tire market by foreign firms evidently makes increasing headway, for imports of tubes for motor vehicles came to 45,154 in 1928 against 28,955 in 1927; for bicycle tubes the figures were 54,016 instead of 25,394; imports of tires for motor vehicles were 92,572 against 46,490, increases of nearly 100 per cent. The increase in entries of cycle tires was even greater, as the totals 102,030 and 34,456 for 1928 and 1927 respectively, show. American tires for motor vehicles have made considerable headway with German consumers since the beginning of 1927. During the first quarter of that year Belgium led with 22,384 tires out of the total 46,490, while America was second with 15,512 tires. By 1928, however, America headed the list, supplying 56,985 out of the total 92,572 tires, that is more than 50 per cent of the total.

In other words, the considerable increase in German tire imports is quite obviously due to American efforts. At the same time it may be indicated that while Belgian shipments were less by almost 6,000, France increased her share from 733 to 6,406 and Italy hers from 5,967 to 11,147. Belgium has the largest share in the shipments of inner tubes and with Italy a close second, leads as source for bicycle tires, the two countries together sending about two thirds of the total number. Imports of all rubber goods came to 18,190 quintals, value 10,153,000 marks, against 8,927 quintals, value 5,643,000 marks, in all an increase in quantity amounting to over 100 per cent.

German Exports

On the whole, German exports of rubber goods increased and were 46,569 quintals, value 28,695,000 marks instead of 39,126 quintals, value 23,448,000 marks. As will be noted, however, the increase in exports does not make up for the rise in imports. Bicycle tubes (870,873 instead of 748,381), footwear (412 quintals against 328 quintals), bicycle tires (309,367 against 271,953), hose and belting (5,481 against 4,677 quintals), showed the most important increases.

It-Packing Prices Increased

At a meeting of the Imperial Association of the German Rubber Industry and the Administration Union of the German Asbestos Industry it was decided to increase the price of It-packing plates by about 10 per cent. It is probable that further increases will be decided on, as the cost of asbestos is mounting. The increase for plates of less than 0.5 mm. thickness is 20 per cent, and for those from 0.5 to 0.9 mm. thick, 10 per cent. Prices of packing rings and shaped pieces of It-plates will also be raised in accordance with a uniform price list for packing to be made out by the Imperial Association of the German Rubber Industry.

German Notes

The Continental Caoutchouc und Gutta Percha Compagnie, Hanover, has this to say in its report: "The situation in the rubber industry did not improve greatly during 1927. Unusually keen competition prevailed among German factories, further aggravated by imports of foreign tires, a fact to be deplored since German tires have been so far improved that they are fully equal to foreign goods both as regards price and quality." The report further touches on the tariff policies of Italy and England, both countries formerly important markets for German tires, which in the case of the latter country forced the Continental company to give up a well developed tire export business as the 33⅓ per cent duty made exportation impossible. Home consumption, the report continues, is affected by the unfavorable conditions prevailing in German agriculture which prevent the use of motor vehicles from developing as rapidly as elsewhere.

As far as the Continental company is concerned, sales increased and all departments were busy. Net profits came to 2,657,598.65 marks, and a dividend of 6 per cent was turned out as compared with no dividend last year, and 10 per cent the year before.

The Asbest und Gummiwerke Alfred Calmon A. G., Hamburg, reports an increasing demand for its products, particularly the Hansa Calmon gymnastic shoes, output of which had to be considerably increased during the year. Sales improved by about 30 per cent, but especially in the first half of the year difficulty was experienced in adjusting selling prices to meet costs because of heavy taxes, wage increases, high costs of cotton and crude asbestos. Extensions and modernization of equipment undertaken during the year called for the expenditure of 390,845.31 marks. No dividend was distributed, the net profits of 73,254.44 marks being carried forward.

Runge-Werke A.-G., Spandau, the well known reclaimers, state that the removal of restriction will not greatly affect the use of reclaim as the amounts of crude rubber thus freed will be considerably below the quantity of reclaim consumed. The firm is, nevertheless, keenly interested in lowering the costs of reclaim as far as possible and has succeeded in developing a process by which, besides the improved regenerated rubber, valuable cotton is also recovered so that a notable decrease in costs will be possible. No dividend will be distributed over the year's working. It seems sales were very satisfactory during the early months of 1928, after which a decline set in, which, however, is not expected to continue for long.

Tire Combine Reported

It is reported that the leading tire manufacturers of Germany are planning to form an automobile tire combine. The companies mentioned are the Continental Caoutchouc-und Gutta Percha Compagnie, Hanover, the Harburger Gummiwarenfabrik, Phoenix, Harburg; the Peters Union, Frankfurt-am-Main; Excelsior Gummiwerke A.-G., Hanover-Limmer, and the German Dunlop company at Hanau.

TOTAL EXPORTS OF FRENCH WEST AFRICAN rubber from Senegal, French Sudan, French Guinea, Ivory Coast, Dahomey, and Niger in recent years were: 1925, 1,736,971 kilos; 1926, 1,878,262 kilos.

The Rubber Industry in the Far East

Malaya

Rubber Areas and Outputs

Some interesting statistics relating to the rubber industry, compiled by the Secretary of State for the Colonies, are now available in the form of a Blue Book. The publication includes particulars of the estimated area under rubber at December 31, 1926, together with the estimated distribution of the area according to nationality of ownership.

ESTIMATED RUBBER AREA

	Acres
British Malaya	2,250,000
Ceylon	450,000
Netherlands East Indies Estates only	1,100,000
Native small holdings variously estimated from	500,000 to 1,000,000
India	140,000
Sarawak and British North Borneo	150,000
French Indo-China	90,000
Siam, Africa, etc.	70,000
Totals, acres	4,750,000 to 5,250,000

The above figures, it is pointed out, include all plantation rubber both estate and native, but can only be regarded as approximate, as India is the only country that has published complete data. Of the native small holdings in the Netherlands East Indies it is probable that not more than one-half, or even less, is at present in bearing.

During 1923-24 and 1924-25 additional export allowances were granted in Malaya to owners of holdings less than 25 acres; the quantity allowed varied with the percentage exportable at the minimum rate of duty. In 1924-25 the standard production of Malaya was increased from 256,200 tons to 276,793 tons, while during 1925-26 the standard production of Malaya was increased from 294,810 tons to 314,853 tons.

The following table gives details of the standard production of rubber in British Malaya and Ceylon for restriction years, November 1 to October 31.

STANDARD PRODUCTION

Year	British Malaya Tons	Ceylon Tons
1922-23	274,000	60,034
1923-24	246,900	62,282
1924-25	276,793	65,807
1925-26	314,853	70,475
1926-27	333,840	73,839
1927-28	315,000 (estimated)	76,300

The table at the bottom of the page shows the estimaetd distribution of the area under rubber at December 31, 1926, according to plantation countries and nationality of ownership.

Most of the figures have been supplied by the Rubber Growers' Association. Those for native small holdings must be looked upon as approximate only. A figure of 750,000 acres has been inserted as a minimum under this head for the Netherlands East Indies. The area of native small holdings in British Malaya may be as much as 700,000 acres of producing rubber.

Ormsby-Gore's Advice to Producers

"I say quite frankly and quite sincerely, do not always trust to State help," the Under-Secretary of State, now visiting Malaya said at a luncheon given in his honor by the Planters' Association of Malaya. "It is not that I object to a little socialistic action here and there, but I do say that the man who is always looking round for the State to help him out of his difficulties will sooner or later go to the wall. . . . There is no use in attempting to hark back to the restriction atmosphere. We have got to go forward to a free atmosphere where efficiency and management of labor will weigh."

Future of Rubber

Naturally much interest is shown in what Mr. Ormsby-Gore has to say at the various functions tendered in his honor. Local representatives of the rubber industry were not slow to criticize the methods of the home government before the Under-Secretary. Mr. Ormsby-Gore, of course, insists that what was done was done to benefit British interests, which the rubber industry fails to see. Nevertheless, looking back over the period of restriction and the period immediately preceding it, the impartial investigator is forced to ask whether perhaps rubber would not have been in a sounder position today if there had not been a restriction scheme.

Necessity aroused sharpened the resourcefulness of the individual planter, so that unbelievable economies, without prejudice to the estate, were found possible in several cases. Other men found ways to use the surplus rubber produced in a profitable manner, and sole crepe and a variety of articles made thereof found their way to the overseas markets.

Manufacturers in the consuming countries were quick to see the profits in many of these articles and got inspiration for other goods from them. The use of rubber liners and the like in machinery dates back to the slump period and rubber paving, which will play an important part in the rubber industry, undoubtedly received its greatest stimulus in the dark pre-restriction and early restriction days, when several new types of blocks were devised right here in Malaya.

The period of prosperity in 1925-1926, while it did not stop experimental work in these new fields overseas, certainly dulled individual enterprise and weakened self-reliance here. With the example of what was done in a period of stress, one cannot help thinking that eventually all this would have led to a sounder and better solution of the rubber problem than restriction. The rubber industry is too young, its possibilities still too little known, for it to be drawn within the confines of any artificial measures to bolster up prices.

If this new slump would lead to a will on the part of each producer to concentrate on solving his own problem of meeting the new situation, instead of scolding the Dutch and Mr. Baldwin, the sudden removal of restriction may turn out to have been a blessing, even if rather heavily disguised.

DISTRIBUTION OF AREA

Nationality of Ownership	British Malaya Acres	Ceylon Acres	Netherlands East Indies Acres	India Acres	Borneo and Sarawak Acres	French Indo-China Acres	Other Countries Acres	Total Acres	Percentage of Total
British (companies registered in the United Kingdom)	825,000	160,000	350,000	70,000	60,000	.....	10,000	1,475,000	29.5
British (companies registered outside the United Kingdom)	375,000	80,000	30,000	20,000	.....	.....	20,000	525,000	10.5
Dutch	.....	.....	525,000	.....	.....	.....	.....	525,000	10.5
French	.....	.....	45,000	.....	.....	90,000	.....	135,000	2.7
American	20,000	.....	75,000	.....	.....	.....	10,000	105,000	2.1
Belgian	8,000	.....	45,000	.....	.....	.....	.....	53,000	1.1
Swiss, etc.	2,000	.....	20,000	.....	.....	.....	.....	22,000	0.4
Asiatic estates	380,000	120,000	10,000	40,000	5,000	.....	30,000	585,000	11.7
Small holdings	640,000	90,000	750,000	10,000	85,000	.....	.....	1,575,000	31.5
Total	2,250,000	450,000	1,850,000	140,000	150,000	90,000	70,000	5,000,000	100.0
Percentage Total	45.0	9.0	37.0	2.8	3.0	1.8	1.4	100.0	.....

Netherlands East Indies

In certain quarters much uneasiness is felt over the increasingly important role that foreign investment is playing in the development of the rich resources of the Dutch Eastern Colonies. It is, of course, recognized that the islands have greatly benefited by the investments of other nationals, but at the same time Dutch political supremacy in the Dutch East Indies is threatened if the Dutch should lose the lead in the economic field. The danger is particularly great as far as the Outer Possessions, and primarily Sumatra, are concerned. In the East Coast of Sumatra 38.1 per cent of the capital invested in agriculture is Dutch and the rest foreign. In Java, the important crops are chiefly in the hands of the Dutch, but of the other industries, trade, shipping, we find a large share in foreign hands.

The Dutch are sensible enough to realize that they are in no position to exclude foreign capital. They, as a whole, do not wish to do so; on the contrary, foreign capital is welcome, and even if this were not so, they know only too well that they have not the necessary power to keep their colonies closed against foreign investors even if they wished to do so. They prefer to keep the door open and trust that the various foreign investors will balance each other and thus help them to pursue a policy of divide and rule. Unfortunately close scrutiny of holdings by other nationals shows there is no such balance. To take agriculture, for instance, the Dutch percentage over the whole territory comes to 60, British 19, France and America each 2, Belgium 3 and Germany 0.7. That is, British capital predominates overwhelmingly as compared with other foreign investments.

The situation, as stated above, is worse in the Outer Possessions, just those territories where development is only just beginning and the opportunity for foreigners to gain the upper hand is greatest. Under these circumstances the Dutch are strongly urged, while keeping the door open for all outside capital, themselves to invest as heavily as possible in the Netherlands East Indies.

Dutch Valorization Scheme

A scheme for the valorization of rubber advanced by P. J. F. Kloppenburg, a well known Dutch banker, has for its object the prevention of wide fluctuating prices of rubber and maintaining it at a remunerative price level. Surplus rubber would be financed at a low price and disposed of in a way that would stimulate consumption, the main outlet being rubber paving.

To attain the end it is proposed to establish a bank with a capital of 15,000,000 guilders. Of this amount 75 per cent would be for subscription by producers on the following terms: (1) Each 70 acres planted with rubber entitles a producer to subscribe for one share of 1,200 guilders; (2) One-third of the amount to be paid in cash on allotment, two-thirds to be redeemed by delivery of 2,000 pounds of rubber credited at 8 pence per pound; (3) Delivery in kind to take place during October-December, 1928. The balance of the capital to be raised by public subscription.

The bank would take care of any surplus production as soon as prices were below 1 shilling per pound and would release the surplus accumulated when prices went above 2 shillings per pound.

Ceylon Wishes Restriction Removed Immediately

The Ceylon Estates Proprietary Association has been negotiating with representatives in Malaya with a view to submitting a joint memorandum to the Secretary of State for the Colonies urging that restriction either be taken off before November 1, or that larger releases than the present quota of 60 per cent should be permitted.

Now H. R. Freeman, of the Legislative Council, Ceylon, has given notice of the following motion: This Council having decided that the rubber restriction scheme is not economic as regards Ceylon, is unwilling that Ceylon should remain any longer in the scheme.

To enable the bank to regulate distribution as above, the British and Dutch governments would have to introduce legislation to compel native and European producers to deliver to the bank a percentage of their production on the following basis:

Average Market Price Pence	Percentage	Delivery Price Pence
12 to 15	20	5
15 to 18	15	4
18 to 21	10	3
21 to 24	5	2

In exchange for the above deliveries, bonds, bearing no interest, but entitling holders to 25 per cent of the banks surplus profit, would be issued to producers. The bank on its side would supply for roadmaking or paving, 75 per cent of its rubber stock to the British and Dutch governments at 12 pence per pound.

Plasticity of Stored Rubber

In the *Archief voor de Rubbercultuur* of April, 1928, Dr. O. de Vries has an article on the influence of different factors on the changes in the plasticity of rubber that is stored.

Rubber containing less than the normal amount of serum substances shows a greater increase in plasticity when stored than is the case with ordinary plantation rubber.

Since rubber containing all serum substances becomes harder when stored, there is a point, probably where the content of serum substances is approximately the same as of ordinary plantation rubber, where the plasticity remains fairly constant. This content of serum substances would, as far as uniformity is concerned, therefore be most desirable.

The plasticity of rubber when stored is hardly affected by the age of trees, the type of acid (acetic or formic), the quantity of acid used in coagulation, mechanical treatment, heating when drying or by smoking.

When a large amount of sodium acetate has been added to the latex, the rubber becomes very soft when stored. Finely cut up, but unwashed, coagulum from matured rubber also becomes very soft, in contrast to crepe from matured coagulum which becomes harder than ordinary crepe.

Coagulation by heating has little effect. Coagulation with alcohol seems to render the rubber somewhat weaker when it is stored. Crepe from ammoniated latex showed changes similar to that from fresh latex. Films of ammoniated latex prepared by evaporation in the air also became very hard when kept, as in the case of ordinary latex films.

The Rubber Union

The Netherlands Rubber Union, that important organization formed to take up the business of remilling native rubber in Borneo and Sumatra, is having its troubles. It seems that in the matter of dealing with the native producers, the straightforward methods known to Occidental business is no match for the sharp practices of the well-schooled Chinese. The Netherlands Rubber Union built a factory at Banjermassin, Borneo, but when it came to the point of obtaining the raw material, native rubber, the concern struck a snag. It made good offers for rubber, but what it got was chiefly water and dirt, everything but honest rubber. Since the buyers for the concern quite evidently lacked the ability, that the Chinese presumably have, of correctly estimating the actual amount of rubber present in the rubber shown by native producers, and paid chiefly for water and rubbish, it is small wonder that the Rubber Union was forced to close the Banjermassin factory before it had fairly started operations, thus putting an end to the organization for remilling in southern and eastern Borneo.

Rubber Patents, Trade Marks and Designs

Machinery Patents

United States

1,669,622. TIRE TESTING MACHINE. This machine is designed to test a tire in a minimum space of time under actual road conditions and on surfaces of materials similar to that of which roads are constructed. It also permits subjecting a tire either to a tread test alone, a carcass test alone or a combination of both. Also the effect of a braking action or accelerating action on the tires may be tested on the machine. V. V. Messer, Douglaston, N. Y., assignor to Goodyear Tire & Rubber Co., Akron, O.

1,669,623. SLUG-CUTTING MACHINE. The object of this device is to adapt a gang die, having a single cutting tool for stamping slugs of uniform volume from sheets of uncured rubber of varying thickness for use in heel making. V. V. Messer, Douglaston, N. Y., assignor to Goodyear Tire & Rubber Co., Akron, O.

1,670,062. PRINTING, WINDING AND PACKING MACHINE. A machine is provided of simple construction whereby steam packings, rubber hose, etc., may be easily wound and packed without the need for skilled operators. The goods to be wound for packing are coiled in a horizontal receptacle by means of a vertical spindle, and when coiled may be prevented from uncoiling on removal by means of tying material carried on a spool. J. Carroll, Brooklyn, assignor to Spadone Machine Co., New York, both in N. Y.

1,670,284. WATCHCASE HEATER. The present invention provides a simple and quickly operative tire vulcanizing heater of the watchcase type that is independent of localized surface wear of the clamping parts and requires a minimum of repair during its life. Two tires can be cured in the heater, one each side, at the same time. The doors are pivotally supported at the top. After the mold cavity is charged the door is closed and a stirrup is thrown over the door locking lever. Application of hydraulic pressure closes the door with any desired degree of pressure. H. A. Lenmire, assignor to General Tire & Rubber Co., both of Akron, O.

1,671,305. MACHINE FOR FOLDING AIR-BAGS. In order to insert a pressure bag into a tire carcass for molding the tire it is necessary to fold it. In the case of this invention the bag can be so folded as to avoid cracking it at the base. It can also be guided when folded into the proper registration with the tire casing and the bag be smoothed out within the tire. T. Midgley, Hampden, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,671,941. TIRE BUILDING MACHINE. This is a flat band tire building apparatus in which means are provided for the assembly of a tire casing in the form of a flat band without unnecessary operations or transportation of parts. An improved stitcher mechanism is included and the apparatus is adapted to take plies of tire fabric from different stock rolls and feed them directly to an expansible drum for centering, alining and building them into a tire band. W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,671,980. TAPE APPLYING MECHANISM. This is designed for applying adhesive tape to an object such as a tire after it has been wrapped with a helical wrapping strip. The adhesive tape is applied around the periphery of the tire while the spiral wrapper is being applied. Jasper Derry, Milford, assignor to Andrew Terkelsen, Boston, both in Mass.

1,672,118. ROLL BEARINGS FOR RUBBER MILLS. In this invention means are provided which will apply requisite rigid pressure to the rolls at a pressure below a predetermined maximum, but will yield when the load exceeds this maximum. Afterward it will automatically reassert itself when the load exceeds the maximum. A. Fraser, assignor to Rissik Fraser & Co., Ltd., both of Croydon, and Francis Shaw & Co., Ltd., Bradford, both in England.

1,669,532. COLLAPSIBLE CORE. C. A. Myers, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,669,554. WRAPPING MACHINE. J. Derry, Medford, assignor to A. Terkelsen, Newton, both in Mass.

1,669,620. TIRE BUILDING MACHINE. E. F. Maas, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,669,634. TRIMMING DEVICE FOR TIRE BUILDING MACHINE. E. G. Templeton, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,669,704. MOLDING APPARATUS. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,669,904. TIRE MOLD CUTTING MACHINE. J. F. Keller, New York, and J. C. Shaw, Brooklyn, assignors to Keller Mechanical Engineering Corp., Brooklyn, both in N. Y.

1,670,061. WRAPPING MACHINE. J. Carroll, Brooklyn, assignor to Spadone Machine Co., Inc., New York, both in N. Y.

1,670,136. RING ENGRAVING MACHINE. A. A. Bush, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

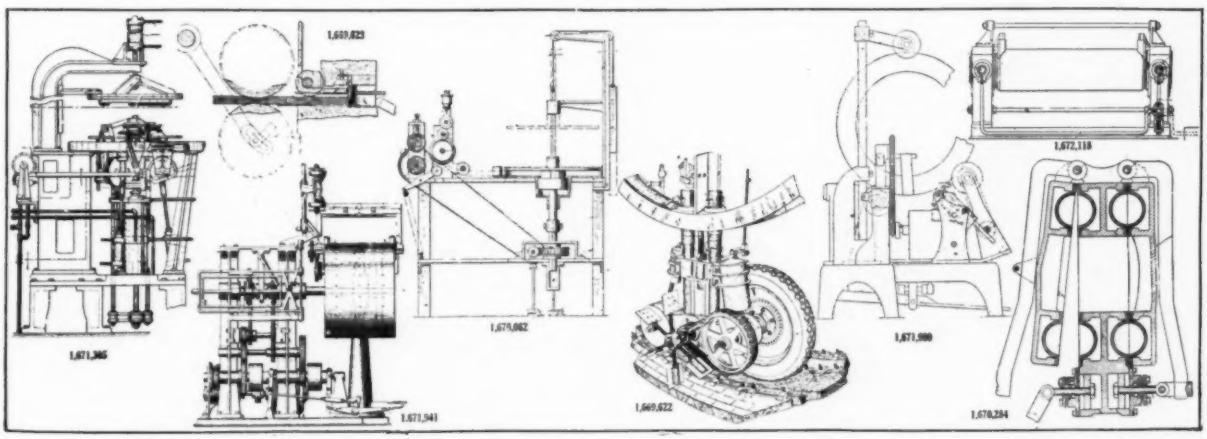
1,670,137. WRAPPING MACHINE. H. Z. Cobb, Thornton, R. I., assignor to The Mechanical Rubber Co., Cleveland, O.

1,670,166. TIRE FINISHING MACHINE. E. D. Putt, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,670,171. CUTTER. H. D. Stevens, assignor to The Firestone Tire & Rubber Co.,, both of Akron, O.

1,670,444, 1,670,445 and 1,670,446. TIRE AND TUBE MAKING APPARATUS. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,670,685. TIRE GAGE. E. S. Marks, Syracuse, N. Y.



Rubber Patents, Trade Marks and Designs

1,670,870. Tire Building Machine. K. O. B. Textorius, New York, N. Y.

1,670,939. Wrapping Machine. G. W. Prouty, Roslindale, assignor to Terkelsen Machine Co., Boston, both in Mass.

1,671,304. Mold Stripping Apparatus. T. Midgley Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,671,333. Test Tank. H. C. Weisse, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,671,355. Mold Opening Machine. A. J. Dexter, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,671,937. Tire Repairing Device. F. W. Scott, Kenmore, assignor to The Firestone Tire & Rubber Co., Akron, both in O.

1,671,940. Tire Building Machine. W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,672,561. Hydraulic Press. W. Ernst, assignor to The Hydraulic Press Mfg. Co., both of Mount Gilead, O.

1,672,593. Washer Applying Device. G. T. Williams, Akron, O.

Dominion of Canada

280,471 Press. C. Macbeth, Birmingham, County of Warwick, England.

280,735 Winding Machine. The Cameron Machine Co., assignee of J. A. Cameron, both of New York, N. Y., U. S. A.

280,736 Web Roll Control Mechanism. The Cameron Machine Co., New York, N. Y., assignee of R. M. Johnstone, Roselle Park, N. J., both in the U. S. A.

280,756 Marking Machine. The Goodyear Tire & Rubber Co., assignee of P. S. Shoaff, both of Akron, O., U. S. A.

280,757 Chafing Strip Machine. The Goodyear Tire & Rubber Co., assignee of R. S. Kirk, both of Akron, O., U. S. A.

United Kingdom

286,657† Retreading Mold. Hartley Et Pons, Usine de la Croix Rompue, Amiens, France.

286,915 Mold for Hard Rubber. A. Fraser, 43 Foxley Lane, Purley and Rissik, Fraser & Co., Ltd., R. & F. Works, Factory Lane, Croydon, both in Surrey.

287,592 Tubing Machine. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, D. F. Twiss and E. A. Murphy, Fort Dunlop, Erdington, Birmingham.

287,639 Trimming Machine. British United Shoe Machinery Co., Ltd., Union Works, Belgrave Rd., Leicester. (United Shoe Machinery Corp., 205 Lincoln St., Boston, Mass., U. S. A.)

287,942† Footwear Machine. Aktieselskabet Dansk Presse-Fabrik, 58 Kloverbladsgade, Valby, Copenhagen, Denmark.

†Not yet accepted.

287,945 Molding Press. R. A. Demme and G. H. Davis, 280 Passaic St., Newark, N. J., U. S. A.

288,248† Vulcanizer. Goodyear Tire & Rubber Co., 1144 East Market St., assignees of R. W. Snyder, 1015 Amelia Ave., both of Akron, O., U. S. A.

288,411 Ornamenting Rubber Machine. Ioco Rubber & Waterproofing Co., Ltd., A. Ryan and J. Kirkwood, Netherton Works, Anniesland, Glasgow.

Germany

460,769 Mill. Lucien Graffe, Neuilly-sur-Seine, France. Represented by E. Lamberts, Berlin S. W. 61.

Designs

Germany

1,029,145 Vulcanization. Max Welzel, Donhoffstrasse 5, Berlin-Karlshorst.

1,029,384 Washing Mill Drive. Fried. Krupp Grusonwerke A.G., Magdeburg-Buckau.

1,029,871 Attaching Heel Patches. Heinrich Weber, Hochstrasse 34, Gelsenkirchen.

Process

United States

1,669,618 Producing Carbon Black. W. K. Lewis, Newton, Mass., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,669,636 Producing Carbon Black. C. S. Venable, Chester, Pa., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,669,732 Forming a Denture. F. W. Barbour, Toronto, Ont., Canada.

1,670,045 Forming Wire Tape. R. C. Pierce, Belleville, N. J., assignor, by mesne assignments, to American Chain Co., Inc., a corporation of N. Y.

1,670,900 Concentrating Latex. A. Peterson, Frankfort-on-the-Main, Germany.

1,671,914 Reenforced Rubber Article. W. B. Wescott, Dover, assignor to Rubber Latex Research Corp., Boston, both in Mass.

1,672,082 Tire Valve Cap. E. G. Oakley, Southport, assignor to Bridgeport Brass Co., Bridgeport, both in Conn.

1,672,132 Making Gaiters. C. H. Morrill, Swampscott, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

Dominion of Canada

280,447 Footwear. H. C. L. Dunker, Halsingborg, Sweden.

280,755 Marking Method. The Goodyear Tire & Rubber Co., assignee of R. P. Dinsmore, both of Akron, O., U. S. A.

Germany

460,256 Chain Knit Goods with Rubber Threads. Vorck & Zimmermann G.m.b.H., Barmen.

460,827 Tire Production. Giuseppe Venosta, Milan, Italy. Represented by W. Ziegler, Berlin-Charlottenburg.

460,910 Coloring Sponge Rubber. A. G. Metzeler & Co., Munich.

Chemical Patents

United States

1,669,490. Vulcanized Patches. A soft rubber-like composition comprising fatty acid "still bottoms" residue products vulcanized with the aid of an accelerator. Wallace Savage, New York, N. Y., assignor to Savage-Rubber Corp., Newark, N. J.

1,669,491. Treatment of Fatty Still Residues. The process comprises treating fatty still residues and compositions containing them at temperatures between about 135 to 205 degrees C., with sulphur and an organic accelerating base. Wallace Savage, assignor to Savage-Rubber Corp., Newark, N. J.

1,669,630. Preparation of Thiazoles. A method of manufacturing 2-mercaptobenzo-thiazole which comprises, causing ortho-nitro-chlorobenzene to react, under positive pressure and elevated temperature, with a water solution of hydrogen sulphide in the presence of hydrogen sulphide and carbon bisulphide. L. B. Sebrell and Jan Teppema, assignees to The Goodyear Tire & Rubber Co., all of Akron, O.

1,670,312. Accelerator. The reaction product of aniline and croton aldehyde in connection with a vulcanizing agent to effect vulcanization. C. O. North, Talmadge Township, and C. W. Christensen, Akron, both in O., assignors to The Rubber Service Laboratories Co., Akron, O.

1,670,598. Molding Liquid and Concentrated Latex. S. D. Sutton, London, Eng., assignor to Veedip, Ltd., Brentford, Eng.

1,670,599. Rubber Composition. A reinforcing agent and filler for rubber consisting of a carbon produced by reaction of carbon monoxide in the presence of a metal catalyst in a finely divided state together with the catalyst on which it is deposited. Francis C. Dyche-Teague, London, Eng.

1,671,314. Rubber-like Body. A process which comprises a polymerized terpene capable of reacting with sulphur, in particles of colloidal size. The dispersed particles are coated with hydrophilic proteid films, tanned, coagulated, separated and dried. W. B. Pratt, Wellesley Hills, Mass., assignor, by mesne assignments, to Dispersions Process, Inc., Dover, Del.

1,671,316. Method of Reclaiming and Dispersing Vulcanized Rubber. Vulcanized rubber is digested at an elevated temperature and pressure with alkali, a softener, and resin oil. The soap thus formed permits dispersion of the mass in water. T. G. Richards, Cambridge, and G. P. F. Smith, Newton, both in Mass., assignees, by mesne assignments, to Dispersions Process, Inc., Dover, Del.

Rubber Patents, Trade Marks and Designs

1,672,157. RUBBER-LIKE PRODUCTS. As a new product vulcanized polymeric rinyl compounds. W. O. Herrmann and W. Haehnel, assignors to Consortium Elektrochemische Industrie, all of Munich, Germany.

1,672,548. ACCELERATOR. A tetra substituted guanidine used in connection with a vulcanizing agent. W. P. Ter Horst, assignor to The Rubber Service Laboratories Co., both of Akron, O.

United Kingdom

286,527. ADHESIVES. A weak solution of gum tragacanth, Irish moss, agar-agar, Indian gum, etc., is added to rubber latex to cause creaming. The cream is then treated with solutions of an alkaline salt and of a germicide. Johnson & Johnson, Ltd., 106 Golden Lane, London.

286,652† REVULCANIZED WASTE RUBBER. Belting for mechanical purposes is made by revulcanizing debeaded, and partly desulphurized tire casing in a stretched-out position. I. Boutems, Antwerp, Belgium.

286,661† RUBBER IMPREGNATED PAPER Closable boxes are made from vegetable pulp impregnated with rubber latex. C. Ross-Wright, Arington, Yatigantota, Ceylon.

286,749. ACCELERATORS. These are produced by combining mercaptans or mercapto-compounds with organic bases other than guanidines. E. C. R. Marks, 57 Lincoln's Inn Fields, London, The Rubber Service Laboratories Co., Akron, O., U. S. A.

287,001. ACCELERATORS. These are produced by combining the reaction product of a mercaptan or mercapto compound and an organic base with an aldehyde. E. C. R. Marks, 57 Lincoln's Inn Fields, London, The Rubber Service Laboratories, Co., Akron, O., U. S. A.

287,206. PLASTIC COMPOSITION. A shoe bottom filler consisting of ground vulcanized rubber, including reclaim fibers, mineral powders, to which are added oils, pitch, tar, wax, etc., to increase flexibility. H. Bloomfield, 72 Kingsley Park Terrace, and Shoe Inventions, Ltd., both in Northampton.

287,445† RUBBER PRESERVATIVE. The reaction products of croton aldehyde and amines such as toluidines, xylidines, naphthylamines, etc., are used as anti-agers for rubber. The Goodyear Tire & Rubber Co., Akron, assignees of L. B. Sebrell, Cuyahoga Falls, both in O., U. S. A.

287,538† PAPER. Rubber and an inert filler is added to paper pulp to make it resistant electrically. Plastic, Inc., Keene, assignees of A. L. Kennedy, both of N. H., U. S. A.

287,946. LATEX. Coagulated latex is molded on porous forms by dipping. Dunlop Rubber Co., Ltd., 32, Osnaburgh St., London. G. W. Trobridge and E. A. Murphy, Fort Dunlop, Erdington, Birmingham.

†Not yet accepted.

288,206† VULCANIZING LATEX. Latex is vulcanized by successive treatment with sulphur dioxide and hydrogen sulphide, coagulation being prevented by various condensation products named. Farbenindustrie, A. G., Frankfort-on-Main, Germany.

288,244† FABRIC LINERS. A coating of nitro cellulose incorporated with a softening agent, is applied to the fabric to make it non-adhesive to rubber when calendering. The Goodyear Tire & Rubber Co., Akron, assignees of L. B. Sebrell, Cuyahoga Falls, both in O., U. S. A.

288,268†. TREATMENT OF LATEX. Latex is stabilized in neutral or acid condition by the aid of sulphonic alkyl aryl reaction products. Naugatuck Chemical Co., Naugatuck, Conn., assignees of J. McGavack, New York, N. Y., both in U. S. A.

288,354. RUBBER COMPOSITION. A non-permeable cellular sheet suitable for use in footwear may be made as follows: rubber, 8 pounds; lithopone, 2½ pounds; zinc oxide, 8 ounces; sulphur, 4½ ounces; fiber, 5 pounds containing 10 per cent of water. H. Broomfield, 72 Kingsley Park Terrace, Northampton.

288,431. WATERPROOFING. The preliminary impregnation for felt hats is a solution of lanoline, lead acetate and alum in petrol. This is followed by a second impregnation of rubber dissolved in petrol to which ammonium sulphoricinate is added. N. Villa, Espereza, Aude Dept., France.

Dominion of Canada

280,213. RUBBER COMPOSITION. A rubber compound comprising rubber, vulcanizing constituents, and preferably oil soluble naphthenic acids derived from mineral oils. The Standard Oil Co., Whiting, Ind., assignee of A. M. Kinney, Chicago, Ill., U. S. A.

280,523. RUBBER ADHESIVE. An aqueous suspension of rubber and an emulsified resinous polymerization product of a higher fraction of a coal tar distillate between 150 and 200 degrees C. The Canadian Consolidated Co., Ltd., Montreal, assignee of M. C. Teague, Jackson Heights, L. I., N. Y., U. S. A.

280,758. DISULPHIDE PROCESSING. A method of treating mercaptothiazoles which causes them to react with sulphur chloride. The Goodyear Tire & Rubber Co., assignee of C. M. Carson, both of Akron, O.

Germany

460,563 RECLAIMING. Syndicat Franco-Neerlandais, Paris. Represented by Dr. O. Arendt, Berlin W. 15.

460,911 VULCANIZING HOLLOW GOODS. Kreuzversand Klotz G. m. b. H., Lindwurmstrasse 76, Munich.

460,950 PURE RUBBER HYDROCARBON FROM LATEX. Dr. Rudolph Pummerer, Erlangen.

461,008 VULCANIZATION. British Dyestuffs Corp., Ltd., Manchester, Cecil John Turrell Cronshaw and William Johnson Smith Naunton, Blackley near Manchester. Represented by Dr. S. Hamburger, Berlin S. W. 61.

461,134 RUBBERIZING FABRICS CONTAINING COPPER AND MANGANESE. Dr. Werner Esch, Osterbekstrasse 43, Hamburg.

General

United States

May 15, 1928*

1,669,583 TIRE. L. J. Wentzel, Brooklyn, N. Y.

1,669,600 BASE BAND. E. Clark, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,669,733 DRESS FORM. H. M. Becher and I. Levin, both of Brooklyn, N. Y.

1,669,854 RUBBER ARTICLE. O. W. Bugg, Beacon, assignor to J. H. Warner, Poughkeepsie, both in N. Y.

1,669,883 TIRE. K. Tschochner and E. Kahlhaupt, Schreckenstein, near Aussig-on-the Elbe, Czechoslovakia.

1,669,901 SOLE. B. F. Hartwell, Winchester, Mass.

1,669,942 ROLLER. O. Linder, assignor to The Ideal Roller & Mfg. Co., both of Chicago, Ill.

1,669,954 TIRE COVER. B. M. Terzibashian, Wichita, Kans.

1,670,158 JAR. L. E. Klug, assignor to Tub-Tex Products, Inc., both of Indianapolis, Ind.

1,670,242 REPAIR PLUG. E. Cook, Pauls Valley, Okla.

May 22, 1928*

1,670,325 FLOAT VALVE. J. M. Teahen, Detroit, Mich.

1,670,366 ELASTIC FABRIC. A. Laurain, assignor to Societe du Caoutchouc Manufacture, both of Paris, France.

1,670,468 BOOT. F. H. Martin and L. H. L'Hollier, Akron, O., assignors to The B. F. Goodrich Co., New York, N. Y.

1,670,575 HEEL GUARD. J. Huss, Mendota, Ill.

1,670,591 LIFE PRESERVER. V. Merifield, Los Angeles, Calif.

1,670,678 PAVING BLOCK. J. S. Cowper, London, England.

1,670,721 TIRE. J. C. Hitchner, Philadelphia, Pa.

1,670,811 SHOE. G. A. Jones, assignor to Shoe Products Inc., both of Lynn, Mass.

1,670,827 TIRE. F. A. Seiberling, assignor to Seiberling Rubber Co., both of Akron, O.

1,670,830 CURTAIN WINDOW. L. M. Spencer, assignor to General Motors Corp., both of Detroit, Mich.

1,671,053 TYPEWRITER PLATEN. B. C. Stickney, Portsmouth, N. H., assignor to Underwood Elliott Fisher Co., New York, N. Y.

1,671,054 PUMP. A. L. Welsh, West Allis, assignor to Allis-Chalmers Mfg. Co., Milwaukee, both in Wis.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Rubber Patents, Trade Marks and Designs

May 29, 1928*

1,671,123 TIRE VALVE. M. J. Payne, assignor to The Payne Valve Corp., both of Staunton, Va.

1,671,167 TIRE VALVE AND PRESSURE ALARM. F. J. Shelby, Indianapolis, Ind.

1,671,235 TOY DOLL. R. A. Freundlich, Brooklyn, N. Y.

1,671,237 BASEBALL. J. H. Grady, assignor to J. H. Grady Mfg. Co., both of St. Louis, Mo.

1,671,349 SEALING STRIP. J. H. Crist, assignor to Crist & Schilken Co., both of Pittsburgh, Pa.

1,671,357 CLOSURE FOR THIEF HOLES FOR TANKS. C. Ehret, Oklahoma City, Okla.

1,671,515 TIRE PRESSURE INDICATOR. A. L. Dentler and R. L. Lesch, Portland, Ore.

1,671,642 INFLATABLE ARTICLE. R. Hopkinson, New York, N. Y., assignor to The Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.

1,671,691 CAP. A. E. Anderson, Chicago, Ill., assignor, by mesne assignments, to New York Rubber Corp., New York, N. Y.

1,671,763 TYPEWRITER PLATEN. C. T. Dickey, Elizabeth, assignor to Rodic Rubber Co., Garwood, both in N. J.

June 5, 1928*

1,671,977 OVERSHOE RECEPTACLE. W. Brown, Detroit, Mich.

1,672,008 INTERLINER. R. Stiattesi, Castello, Florence, Italy.

1,672,186 ELASTIC FABRIC. H. W. Wilson, assignor to J. W. Wood Elastic Web Co., both of Stoughton, Mass.

1,672,296 ABDOMINAL SUPPORT. M. C. Benisch, Corona, N. Y.

1,672,325 GARMENT SUPPORT. M. E. Kintz, Los Angeles, Calif.

1,672,347 CLAMP. H. W. Schwarz, Mart, Tex.

1,672,395 DEVICE FOR PRACTICING GOLF. L. D. Shinn and A. T. Shinn, both of Washington, D. C.

1,672,432 GARMENT. G. W. Spalding, Worcester, Mass., assignor to The Royal Worcester Corset Co., a corporation of Mass.

1,672,473 INFLATABLE AND COLLAPSIBLE BOAT. F. Scheibert, Lubben, Germany.

1,672,655 SHOE SOLE. L. M. Oakley, assignor to Essex Rubber Co., both of Trenton, N. J.

1,672,734 NIPPLE. C. J. Reilly, assignor of one third to E. B. Norman and one third to E. S. Butler, all of New Orleans, La.

1,672,762 and 1,672,763 BATHING SUIT. H. J. Knapp, Akron, O.

1,672,821 CABLE CORE. C. Martell, Cicero, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,672,824 WRINGER SCRAPER. H. L. Morin, Detroit, Mich.

1,672,858 TIRE TUBE AND FLAP. C. F. Fisk, Camden, N. J., H. L. Fisk administratrix of said C. F. Fisk, deceased.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Dominion of Canada

May 15, 1928

280,100 CARPET BACKING. A. E. Hemsworth, Birmingham, County of Warwick, England.

280,206 SUBMARINE VESSEL. The Rubwood, Inc., Lawrence, assignee of H. N. Atwood, Monson, both in Mass., U. S. A.

May 22, 1928

280,415 PACKING. The Chicago Rhopac Products Co., Chicago, Ill., assignee of A. M. Johnson, Shadelands Ranch, near Concord, Calif., both in the U. S. A.

May 29, 1928

280,449 SHOCK ABSORBER. W. F. Gammeter, Cadiz, O., U. S. A.

280,470 JOINT. H. C. Lord, Erie, Pa., U. S. A.

280,579 HEEL. The Rubwood, Inc., Lawrence, assignee of H. N. Atwood, Monson, both in Mass., U. S. A.

June 5, 1928

280,630 PATCH. G. E. Blaylock, Baltimore, Md., U. S. A.

United Kingdom

May 2, 1928

286,683† ABRASIVE WHEEL. J. R. Gammeter, 7 North Portage Path, Akron, O., U. S. A.

286,714† MASSAGE APPLIANCE. J. Kazmazyk, 18 Eugenstrasse, Friedrichshafen-on-Bodensee, and Haselmeer, 1 Obere Weinstege, Degerloch, Stuttgart, both in Germany.

286,716† CARD CLOTH. T. Kohl, 314 Route de Stembert and J. Fraiteur, 2 Rue du Gazometre, both in Verviers, Belgium.

286,881 PRINTING SURFACE. J. T. Clarke & Son and H. R. Clarke, Charles St., Manchester.

May 9, 1928

287,051† SOUND DAMPING DEVICE. F. Kruckenberg, Unter der Schanz, Heidelberg, Germany.

287,075† BATH GLOVE. Soc. Du Caoutchouc Manufacture, 86 Rue Notre Dame de Nazareth, Paris, France.

287,109† SINK CLEANER. S. Solling, 1 Skansepalae, Aarhus, Denmark.

287,174† AUTO BODY. F. Kruckenberg, 1 Unter-der-Schanz, Heidelberg, Germany.

287,239 ELECTRIC CABLE COUPLING. W. R. MacDonald, Britannic House, Finsbury Circus, London.

287,331 EAR SHIELD. A Farrell, 8 Factory St., Nielston, Renfrewshire.

May 16, 1928

287,497† GOLF CLUB. P. E. Heller, 242 Elwood Ave., Newark, N. J., U. S. A.

287,546 SLEEVE. H. Pechadre, 18 Rue St. - Croix - de - la - Bretonnerie, Paris, France.

287,569† SWIMMING APPARATUS. R. G. Chaligne, 35 Rue Boulard, Paris, France.

287,572† TEAT CUP. Aktiebolaget Separator, 8 Fleminggatan, Stockholm, Sweden.

287,682 POLISHING DEVICE. D. McIntyre, 13 Duncan St., Greenock.

287,687 HOSE. J. M. Oden, 253 Tillary St., Brooklyn, N. Y., U. S. A.

287,723 FEEDING BOTTLE. R. G. A. Beck, 14 Hospital St., Montreal, Canada.

287,738 HORSESHOE. A. L. Temple, Hickling, Nottinghamshire.

287,739 PACKING. J. H. Stuthridge and T. M. Hack, 22 Siemert Rd., Johannesburg, South Africa.

287,766 ARCH SUPPORT. W. J. Giles, 34 St. Germans Rd., Forest Hill, London.

287,772 MEDICAL APPLIANCE. C. P. Tomasulo, 52 King St., New York, N. Y., U. S. A.

287,816 BALL. F. H. Ayres, Ltd., 111 Aldersgate St., London, and J. H. Smith, Lingham, Higham Lane, Nuneaton, Warwickshire.

May 23, 1928

287,894 VALVE. G. Gutkind, 3 Heideloffplatz, Nuremberg, Germany.

288,040 PNEUMATIC CUSHIONING DEVICE. H. De W. Senitha, 505 Fifth Ave., New York, N. Y., U. S. A.

288,048 LIFE PRESERVER. V. Merifield and C. C. Barclay, 1825 North Wilton Place, Los Angeles, Calif., U. S. A.

288,071 VEHICLE BRAKE. D'A. M. Clark, 5 Chancery Lane, London. (Bendix Brake Co., 231 South La Salle St., Chicago, Ill., U. S. A.)

288,078 SHAVING STICK HOLDER. S. H. Wigget, 43 St. François Xavier St., Montreal, Canada.

288,111 WEATHER EXCLUDERS. J. P. Pendlebury, 4 Wentworth St., Bolton.

288,116 TIRE. D. M. Weigel, 120 Broadway, New York, N. Y., U. S. A.

May 31, 1928

288,220 SURGICAL PROTECTOR. D. Sarason, 17 Heinrich Hertzstrasse, Hamburg, Germany.

288,353 SPRING. H. S. Powell, 316 Catherine St., Utica, N. Y., U. S. A.

288,402 SQUEEGEE. A. M. Brown, Dunton House, Thorpe Rd., Peterborough.

288,458 TIRE. H. Wieser. 43 Aeussere Wienerstrasse, Munich, Germany.

†Not yet accepted.

Germany

460,016 BABY PANTS. Dr. Istvan Dorogi, Dr. Lajos Dorogi and Dr. Dorogi & Co., Gummiwarenfabrik A.G., Budapest-Albertfalva. Represented by W. Fritze, Berlin S. W. 61.

460,248 BLADDER. Harburger Gummi-warenfabrik Phoenix A.G., Harburg.

460,360 TOOTH BRUSH. Rudolph Buxbaum, Kyjov (Gaya), Czecho-slovakia. Represented by A. Kuhn, Berlin S. W. 61.

Rubber Patents, Trade Marks and Designs

Designs

Germany

1,028,512 TENNIS BALL. Oskar Fromme, Kleinschmieden 6, Halle a.d.S.

1,028,882 INTERCHANGEABLE RUBBER HEEL. Hermann Basse, Nikolaistrasse 21, Hannover.

1,029,078 BRUSH. J. Samuel Gummiwaren-Fabrik, Gustrow il, Mecklbg.

1,029,202 HEEL. Max Keller, Schanzenstrasse 56-62, Hamburg.

1,029,266 INFLATABLE HOLLOW BODY. Herbert Lindemann, Wandsbek.

1,029,819 ATOMIZER FOR POWDER. Heinrich Hauck, Amberg, Oberpf.

1,029,830 RUBBER TEETHING RING. Gummiwaren-Fabrik, M. Steinberg, Koln-Lindenthal.

1,029,885 HAIRDRESSERS' CLOTH. Frau Karl Schombart Wäschefabrik, Schlebusch, bei Koln.

1,030,051 WEBBING FOR STOCKINGS. Firma Hermann Kohler, Zeulenroda, Thuringia.

1,030,063 COVER FOR BICYCLES AND MOTOR VEHICLES. Helmut Hagemann, Paulinenstrasse 12, Leipzig.

1,030,191 NIPPLE. Otto Bahr, Cottbus-Madlow.

1,030,335 CYCLE COVER. Harburger Gummiwaren-Fabrik, Phoenix, A. G., Harburg a.d.E.

1,030,844 FOOT SUPPORT. Carl Schirmer, Dusseldorf-Unterrath.

1,030,921 MILK PUMP BULB. Continental Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

1,030,985 SOLE. Freitaler Schuhfabrik, Robert Gebauer, Freital-Deuben.

1,031,089. RACING TIRE. Wilhelm Przygodda, Levenhove 4, Essen-Altenessen, III.

1,031,412 HAIR WAVER. Georg A. Schulz, Bruckenstrasse 18, Heidelberg.

1,031,451. WEBBING. C. P. Muller G.m.b.H., Barmen.

1,031,561 CYCLE TIRE. Wilh. Joachim Grater, Augsburg, E. 205½.

1,031,563 VASE. Anton Kro 1, Viersen.

1,031,644 KETTLE SCRAPER. Joseph Hackinger, Rupholding, Oberbay.

1,031,823 COLLAPSIBLE BATH. Elise Gartenschlager, née Kleist, Goethestrasse 44, Berlin-Charlottenburg 4.

1,031,966 GLOVE. A. Artur Korta, Kirchenlamitzst., Oberfr.

1,032,012 BABY PANTS. Dr. Istvan Dorogi, Dr. Lajos Dorogi, and Dr Dorogi & Co. Gummifabrik A. G., Budapest-Albertfalva. Represented by W. Fritze, Berlin S. W. 61.

1,032,220 HAIR BRUSH. Firma N. Bruck. Landau, Pfalz.

1,032,221 HAIR BRUSH. Firma N. Bruck, Landau, Pfalz.

1,032,740 BATHING SHOE. Elly Gutmann, née Plachte, Mommsenstrasse 53-54, Berlin-Charlottenburg 4.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b) are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

May 22, 1928

Act of February 20, 1905

242,273 R-B—conducting hose. Goodall Rubber Co., Inc., Philadelphia, Pa.

242,318 Fancy double circle, in the center of which are the words: GOLD SEAL, 1872; enclosed within the outer circle the words: "GOODYEAR RUBBER CO." — pneumatic tires and inner tubes. Goodyear Rubber Co., New York, N. Y.

242,384 RUBBER FOAM—cellular rubber. C. M. Co. of America, Inc., Chicago, Ill.

242,423 and 242,424 AIRPORT—pneumatic tires and tubes. The Badger Rubber Works, Milwaukee, Wis.

242,425 Oval containing the representation of an airplane—pneumatic tires and tubes. The Badger Rubber Works, Milkaukee, Wis.

242,442 RUBBERSET—golf balls. Andrew Albright, Jr., Newark, N. J.

242,443 FLYING FOOL—golf balls. Andrew Albright, Jr., Newark, N. J.

Act of March 19, 1920

242,480 ANTIOCH SHOES—shoes of leather, rubber, etc. Antioch College of Yellow Springs, Greene Co., O., Yellow Spring, O.

May 29, 1928

Act of February 20, 1905

242,511 Representation of a dog's head, in small type above the representation the word: "MASTERBILT"; in larger type on either side of the representation the word: "MASTERBILT" — pneumatic tires and tubes. J. E. Forsell, doing business as Old Trusty Co., Clay Center, Neb.

242,519 Double circle surrounding a chemical symbol, enclosed within the circles the words: "H. TH. BÖHME A-G" and "CHEMNITZ"—chemical dyeing preparations and chemical solvents for rubber. H. Th. Böhme A. G., Chemnitz, Germany.

242,551 Cross containing the representation of a foot and the words: "PEDI-ATRIC SHOE," above the cross the word: "BENJAMIN'S"—shoes of leather, rubber, etc. Benjamin Rosman, New York, N. Y.

242,641 NATION-WIDE — narrow elastic. J. C. Penney Co., Wilmington, Del., and New York, N. Y.

242,658 WISCONO—pneumatic tires and tubes. The Fisk Rubber Co., Chicopee Falls, Mass.

Act of March 19, 1920

242,734 DELMAN—shoes of leather, rubber, etc. Delman, Inc., New York, N. Y.

June 5, 1928

Act of February 20, 1905

242,741 Large letter "C" with a triangle on either side, beneath the letter the word: "COMMANDER"—shoe heels. The Holtite Mfg. Co., Baltimore, Md.

242,744 Pennant containing the words: "PLAY CHUMS"—shoes of leather, rubber, etc. Cedar Grove Shoe Mfg. Co., Cedar Grove, Wis.

242,767 MERMAID—rubber tank valve balls. Wolverine Brass Works, Grand Rapids, Mich.

242,778 SPRINGLASTIC—hose supporters, suspenders, elastic sleeve bands, garter supporting belts, brassieres, corsets, etc. Steellastic Co., Long Beach, Calif.

242,783 Circle enclosing the word: "ASTORIA," which runs horizontally and vertically across; an outer circle encloses the words: "PHOTO ENGRAVERS SUPPLY CO."—cement. Astoria Photo-Engravers Supply Co., Long Island City, N. Y.

242,789 Square containing the letter "L"—pneumatic tires. Lambert Tire & Rubber Co., Barberton, O.

242,793 CYCLOPS—belting and hose. Boston Woven Hose & Rubber Co., Cambridge, Mass.

242,805 ROMAC—tire and tube repair kits, tire linings, blowout patches, vulcanizing canvas, fabric hose and canvas belting. Romac Motor Accessories, Ltd., London, England.

242,819 GOLDEN RULE CORD—tires for motor vehicles. L. H. Smith, doing business as Surplus Auto Supply Co., Chicago, Ill.

242,821 MULTIFIT—boots and shoes of rubber and fabric. Firestone-Apsley Rubber Co., Hudson, Mass.

242,834 The words: "FITS RITE," between the two words a double triangle containing the letter: "T"—inner tubes for tires. The Triangle Tire & Rubber Co., Canton, O.

242,851 Double circle surrounded by a floral design and enclosing the initials: "LL"—heels and soles for boots and shoes made of rubber, rubber compounds and gutta percha. Levine Leather Co., Ltd., Toronto, Ont., Can.

242,934 JIFFY—gaiters. Sears, Roebuck & Co., Chicago, Ill.

242,936 IVORY—garters. A. Stein & Co., Chicago, Ill.

242,937 THALYSIA—footwear and wearing apparel. Thalysia Paul Garms Gesellschaft Mit Beschränkter Haftung, Liepzig, Germany.

242,972 Representation of a portion of a boot—boots, shoes and oxfords of leather, rubber, fabric, etc. The Huiskamp Bros. Co., Keokuk, Iowa.

Rubber Patents, Trade Marks and Designs

Dominion of Canada

May 15, 1928

43,747 Square medallion with rounded corners, surrounded by one comparatively wide and two narrow borders; within the center of the medallion appears a device of the caravel or decked ship of Christopher Columbus, known as the Santa Maria; within the wide border, and the upper portion thereof, appear the words: "THE COLUMBUS RUBBER CO. OF MONTREAL, LTD.," while the lower portion contains the words: "RUBBER FOOTWEAR"—footwear. The Columbus Rubber Co. of Montreal, Ltd., Montreal, Que.

43,759 "SPHINX," in association with a figure in representation of the Sphinx—fabric covered rubber glass run channels. Detroit Rubber Products, Inc., Detroit, Mich., U. S. A.

43,837 "PRIMEX"—footwear. Columbus Rubber Co. of Montreal, Ltd., Montreal, Que.

43,858 Substantially double oval or elliptical frame within which appears the representation of a beaver gnawing a maple log and the words: "DOMINION RUBBER SYSTEM" arranged in concavo-convex form of type so as to suitably fill the space; the word: "DOMINION" interrupting the double oval or ellipse to permit of greater prominence—rubber goods. Dominion Rubber Co., Ltd., Montreal, Que.

United Kingdom

May 2, 1928

476,640 MACINTOSH 1824—tires. Charles Macintosh & Co., Ltd., 2, Cambridge St., Manchester.

489,322 Fanciful representation at the top of which is the date: "1891"; at the bottom the word; "HELSINGBORG"; beneath the representation the words: "TRE TORN"—galoshes, boots and gymnasium shoes. Helsingborgs Gummifabriks Aktiebolag, Furutorpsgatan, Block Esculap Nos. 1, 2, 14, 15, 16 and 17, Helsingborg, Sweden.

489,422 Representation of a diamond around which are the letters: "P L E"—tires and inner tubes. Pirelli, Ltd., Pirelli House, 144, Queen Victoria St., London, E. C. 4.

May 9, 1928

484,572 GRIFFIN—elastic webs, braids and cords. S. and J. Watts & Co., 35, Portland St., Manchester.

484,573 Fanciful representation—elastic webs, braids and cords. S. & J. Watts & Co., 35, Portland St., Manchester.

487,231 DELAIDE—soles and heels. The Dela Rubber Co., Ltd., 2, Cambridge St., Manchester.

488,158 AMULETTE—druggists' sundries. "Vulkan" Gummiwarenfabrik Weiss & Baessler Aktiengesellschaft, 26, Kaiserstrasse, Leipzig-Lindenau, Germany.

489,091 SPARTAN—waterproof and rainproof coats and capes. David Christie Lees, 75, Albany St., London, N. W. 1.

May 16, 1928

488,868 STARPRITE—rubber and gutta percha goods. Archibald Turner & Co., Ltd., 7, Jewin St., London, E. C. 1.

489,504 ANDERFLOAT—swimming belts. Andersons' Rubber Co., Ltd., 35, St. Paul's Churchyard, London, E. C. 4.

May 23, 1928

487,228 RHINIDE—soles and heels for boots, sheets. A. B. Wagnell, trading as The Rhinide Co., 3, Queen's Rd., Reading.

487,447 WHIPPET—rubber and gutta percha goods. The Avon India Rubber Co., Ltd., Rubber Works, Bath Rd., Melksham, Wiltshire.

May 30, 1928

484,233 JOHNSON'S—sheeting and tubing. Johnson & Johnson (Gt. Britain), Ltd., 106, Golden Lane, London, E. C. 1.

487,751 GREENITE—waterproof garments. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate, Salford, Lancashire.

487,752 GREENITE—all goods included in Class 40. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate, Salford, Lancashire.

487,806 Square containing the representation of a boy holding tennis racket and balls—sporting articles used in tennis. The Dunlop Rubber Co., Ltd., Fort Dunlop, Holly Lane, Erdington.

488,927 GIRCO—insulated electric cables and conductors. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate, Salford, Lancashire.

488,928 IRCOL—insulated electric cables and conductors. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate, Salford, Lancashire.

489,043 SUNBEAM—hot water bottles. Southall Bros. & Barclay, Ltd., 19, Lower Priory, Birmingham.

490,382 PIRELLI—pneumatic, semi-pneumatic and solid tires. Pirelli, Ltd., Pirelli House, 144, Queen Victoria St., London, E. C. 4.

Designs

United States

75,198 GOLF BALL. Term 14 years. L. A. Young, Detroit, Mich.

75,226 COVER PIECE FOR LAWN TENNIS BALLS. Term 7 years, John Dolman, assignor to A. W. Phillips, Ltd., both of Nuneaton, England.

75,311 TIRE. Term 14 years. E. E. Werner, Carroll, Neb.

75,374 TIRE CASING. Term 14 years. Frederick Leopold, Jr., Harmonville, assignor to Lee Rubber & Tire Corp., Conshohocken, both in Pa.

75,422 GOLF BALL. Term 14 years. Louis Gioggia, West New York, assignor to St. Mungo Mfg. Co. of America, Newark, both in N. J.

75,457 COMBINED SOLE AND HEEL. Term 14 years. H. H. Wydom, Boston, assignor to Hood Rubber Co., Watertown, both in Mass.

Labels

United States

34,118 GENUINE LINDY'S SEAL TIGHT TUBE PATCH KIT. THE WORLDS BEST SELF-VULCANIZING SOLD FROM COAST TO COAST MENDS ANYTHING MADE OF RUBBER. Rubber patch outfit. G. J. Reid, doing business as The Consumers Co., Milwaukee, Wis. Published July 1, 1927.

34,132 PUNCTURE SEAL. Sealing punctures in tires. A. C. Vest, doing business as A. C. Vest Mfg. Co., Tampa, Fla. Published Dec. 1, 1928.

Mohawk Flap Punch

The Mohawk Rubber Co.'s Akron, O., double duty flap punch saves time, flap stock and insures clean-cut holes of the correct size and shape. After cutting the proper flap length immerse about four inches of both ends of the flap in water to facilitate cutting. Place the cutting surface of the oval punch in the center of one end of the flap, being careful to get the measuring line of the upper side of the flap tool parallel and directly above the end of the flap. A single, firm hammer blow directly on top of the oval punch will complete the operation. For the round hole reverse the flap punch and repeat the operation on the other end of the flap.

Legal

Putnam Balloon Tire Suit Decision

Federal Judge Arthur J. Tuttle, in a decision rendered in the U. S. District Court, Detroit, Mich., June 14, refused to sustain the Alden T. Putnam patent for balloon tires, held by the Steel Wheel Corp. of Lansing, Mich., and made by that company the basis of its patent infringement suit against The B. F. Goodrich Co. of Akron, O. The right of the Steel Wheel Corp. to manufacture balloon tires exclusively in the United States was denied.

The decision, which would have involved millions of dollars in royalties, was based on prior use by the Goodrich company.

Counsel for the Steel Wheel Corp. announced that an appeal would be taken.

Goodyear Company Wins Stockholders' Suit

The minority stockholders' suit against the Goodyear Tire & Rubber Co. was dismissed by a decision of Judge Will S. Stephenson of the Common Pleas Court of Cleveland, O. The legality of the refinancing plan of the company was upheld by this decision, the court declaring that the mandatory injunction brought by the minority interests had been completely satisfied by the explanations the Goodyear officials gave in their testimony.

The suit was brought by a group which represented less than 1 per cent of the stockholders, the majority of whom had changed, before the case was called, their old preferred stock on a basis of one share of old for one and one-fourth of new stock.

Hoffman-Gottlob Patent Invalid

The United States Circuit Court of Appeals for the Second District affirmed the decree of the District Court in the action of the National Aniline & Chemical Co., against the Grasselli Chemical Co., and holds invalid the broad claims of the Hoffmann-Gottlob U. S. patent No. 1,149,580. This decision is of great importance to all rubber companies as this patent purported to cover the use as accelerators of vulcanization of a wide range of products including diphenyl guanidine, and tri-phenyl guanidine.

Adjudicated Patents

HEELS (D. C. Mass.). The Tufford reissue patent, No. 14,049, for improvement in resilient heels, claims 5—9. Held not infringed. I. T. S. Rubber Co. v. Essex Rubber Co., 25 F. (2d) 180. *Official Gazette*, Vol. 371, p. 5.

Patent Suits

ACCELERATOR. No. 1,411,231, M. L. Weiss, vulcanization accelerator, D. C., N. D. Ohio, E. Div., Doc. 2373, Dovan Chemical Corp. v. Firestone Tire & Rubber Co. Dismissed without prejudice March 10, 1928. *Official Gazette*, Vol. 370, p. 515.

PATCHES. No. 1,489,477, Bowes & Bowes, process for rubber patches, C. C. A., 8th Cir. (St. Louis), Doc. 7801, P. L. Knick (Knick's Mend-Rite Mfg. Co.) v. Bowes "Seal-Fast" Corp. Reversed and cause remanded to lower court Mar. 21, 1928. *Official Gazette*, Vol. 370, p. 1019.

Treasury Decisions

SNAKES—PUZZLES—KINOS—TOYS. No. 5921, Protests 78893-G, etc., of Franko American Novelty Co. et al. (New York). Wooden and rubber articles in the form of snakes, so-called Chinese puzzles consisting of numbered blocks of wood in a small cardboard box, and an article invoiced as "kinos," classified as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, are claimed dutiable at various lower rates. Opinion by J. Sullivan: It was found that the testimony, while not entirely satisfactory as to use or commercial designation, indicated that all the articles except the kinos are toys. On the whole record as presented it was held that the collector correctly classified the merchandise. The protests were therefore overruled. *Treasury Decisions*, Vol. 53, No. 21, p. 11.

RUBBER BALLS. No. 6133. Protests 53693-G, etc., of F. W. Woolworth Co. (New York and Seattle). Fancy colored rubber balls 2½ to 3 inches in diameter classified as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, are claimed dutiable under the provision for balls in paragraph 1402 at 30 per cent. Opinion by J. Sullivan: The testimony showed that these balls have a use in games and sports by both children and adults. From a reading of paragraph 1402 it was held to cover almost every conceivable form of ball except such as may be played with by a baby. On the authority of Illfelder v. United States (1 Ct. Cust. Appls. 109; T. D. 31115) these balls were found not to be toys but balls used in indoor or outdoor games or sports. They were therefore held dutiable under paragraph 1402 as claimed.

J. McClelland dissented, citing his dissenting opinion in G. A. 8807 (T. D. 40210), affirmed in United States v. Stewart, supra, stating that the decision in United States v. State Forwarding & Shipping Co. (13 Ct. Cust. Appls. 287; T. D. 41216), relating to return balls used by children in play, is a later expression of the Court of Customs Appeals and should be followed in this case. *Treasury Decisions*, Vol. 53, No. 23, p. 21.

SOLID RUBBER INNER TUBES—AUTOMOBILE TIRES. No. 6148. Protest 176614-G of A. W. Fenton Co. (Cleveland). Automobile inner tubes imported from Australia, composed of a solid rubber composition, classified at the appropriate countervailing duty of 33 1/3 per cent ad valorem under paragraph 369, tariff act of 1922, are claimed dutiable as automobile tires at 10 per cent under paragraph 1439, or as manufactures of india rubber at 25 per cent. Opinion by C. J. Fischer: On authority of Abstract 4705 the inner tubes in question were held properly classified under paragraph 369. J. Tilson, not concurring. *Treasury Decisions*, Vol. 53, No. 23, p. 24.

Carbon Black in 1927

According to G. R. Hopkins of the U. S. Bureau of Mines the total production of carbon black in 1927 was 198,429,000 pounds, an increase over 1926 of 17,863,000 pounds or 9.9 per cent. The average price was 5.5 cents a pound, unchanged from 1926. Total sales were 223,430,000 pounds, an increase over the preceding year of 33.4 per cent. Of this total 168,999,000 pounds went into domestic consumption and 54,431,000 were exported.

The chief center of carbon black production is still the Monroe district of Louisiana. Texas is credited with the increased output of 1927 when it produced 56,396,000 pounds or 20,000,000 pounds more than in 1926. Production in Kentucky and West Virginia continued to decline and in Montana and Wyoming it increased. The number of operators remains at 33, and plants are 62, a decrease of one from 1926.

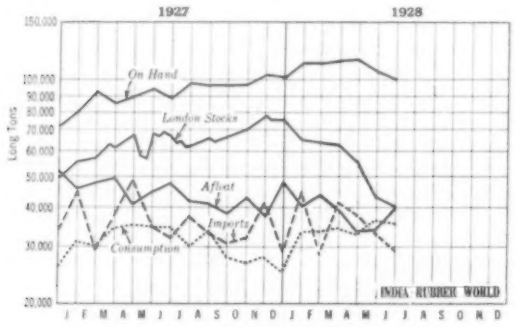
The channel process continues to be the chief mode of production and is credited with having turned out 84.3 per cent of the 1927 total or 167,357,000 pounds. Most of the 40,705,000 pounds increase of domestic sales of carbon black is credited to the rubber industry which accounts for practically half of the domestic consumption.

A Rubber Safety Button

To lessen the danger to which motorists are exposed by striking metal safety buttons when running at high speed, a western inventor is experimenting with a safety or traffic button made wholly of rubber. In design it quite duplicates the familiar ribbed cast iron dome used at street intersections and other places. It is colored with a mineral red, and it is claimed that it can not become discolored like painted metal buttons, and unlike the latter will be harmless to tires and practically as durable as metal buttons. This resilient marker is being tried out in sections where traffic is exceptionally heavy and reports as to its serviceability are very favorable.

Imports, Consumption and Stocks

The accompanying graph covers crude rubber importation, consumption and stocks for 1927 and the first 6 months of 1928. Stocks on hand in May were 105,356 tons, a decrease of 8,444 tons. For June stocks on hand are estimated at 100,000 tons or 5,356 tons less than for May.



U. S. Imports, Consumption and Stocks

Consumption, actual and estimated, for the first 6 months of 1928 was exceeded by importations by only 5,756 tons. In the 10 weeks preceding June 23 London stocks have diminished by 19,000 tons. These figures suggest an impending shortage by early autumn, because the importations are running strongly below stocks consumed, especially as estimated for June.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

Twelve Months	Imports Tons	Consumption Tons	Stocks: On Hand Tons	Stocks: Afloat Tons	Stocks: London Tons	Stocks: Singapore and Penang Tons
1925	384,837	389,136	51,000*	48,000*	.....	.....
1926	411,900	366,140	72,510*	52,019*	.....	.....
1927	426,258	370,915	100,130*	47,939*	63,207*	25,868*
1928						
January	46,200	34,403	110,114	41,256	66,285	25,868
February	29,445	33,703	108,955	43,316	62,500	22,867
March	40,894	35,688	114,061	39,324	61,000	20,538
April	37,240	32,779	113,800	33,986	55,000	16,946
May	32,883	37,333	105,356	34,374	43,716	17,687
June (est.)	29,000	36,000	100,000	40,000††	.....	.....

*December 31.
††June 23.
The 1928 figures, unless otherwise specified, are all as of the first of each month.

British Malaya

RUBBER EXPORTS

An official cablegram from Singapore to the Malay States Information Agency, Malay House, 57 Charing Cross, London, S. W. 1, England, states that the amount of rubber exported in May last totaled 26,403 tons. The amount of rubber imported was 10,350 tons, of which 8,085 tons were declared as wet rubber. The following are comparative statistics:

	1927 Gross Exports Tons	1927 Foreign Imports Tons	1928 Gross Exports Tons	1928 Foreign Imports Tons
January	34,946	14,995	27,731	16,618
February	27,528	11,697	28,813	12,911
March	41,346	17,462	27,813	10,508
April	29,041	13,069	20,029	9,335
May	31,393	15,491	26,403	10,350
Totals	164,254	72,714	130,789	59,722

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya, and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of April and May, 1928:

	April, 1928 Tons	May, 1928 Tons
United Kingdom	2,585	5,249
United States	13,425	16,450
Continent of Europe	1,500	1,960
British Possessions	469	373
Japan	2,025	2,336
Other foreign countries	25	35
Totals	20,029	26,403

Inventory—Production—Shipments of Pneumatic Casings—Inner Tubes—Solid Tires—Rubber and Fabric Consumption

	High Pressure Pneumatic Casings: Cord Inventory	Cord Production	Cord Total Shipments	Fabric Inventory	Fabric Production	Fabric Total Shipments
1927	.....	21,527,278	21,733,962	.....	766,581	1,198,549
1928						
January	3,605,064	1,684,750	1,496,047	200,322	56,218	60,404
February	4,394,561	1,697,498	1,244,812	222,655	53,220	28,719
March	4,355,309	1,564,346	1,302,644	235,673	33,168	28,431
April	4,331,499*	1,307,759	1,347,854	223,274*	16,198	27,523

	High Pressure Inner Tubes: Inventory	Production	Total Shipments	Balloon Inner Tubes: Inventory	Production	Total Shipments
1927	.....	27,398,535	29,528,108	.....	25,718,529	25,143,821
1928						
January	5,328,071	1,669,894	2,014,744	4,408,235	2,411,124	2,539,535
February	5,941,626	1,949,539	1,470,668	5,046,021	3,221,756	2,602,362
March	6,071,983	1,740,238	1,442,162	5,782,551	3,683,017	2,856,342
April	6,044,843*	1,628,576	1,459,826	6,434,307*	3,366,957	2,815,778

	Balloon Casings: Inventory	Production	Total Shipments	Solid and Cushion Tires: Inventory	Production	Total Shipments
1927	.....	26,037,452	25,111,903	.....	558,030	558,007
1928						
January	3,656,537	2,377,299	2,489,391	161,329	36,279	33,797
February	4,173,493	3,021,548	2,500,013	156,790	36,328	38,715
March	4,700,534	3,516,480	2,967,476	156,424	42,950	44,665
April	4,983,023*	3,309,351	2,983,454	154,477*	43,255	42,145

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds
1927	177,979,818	463,661,466
1928		
January	16,039,819	43,709,438
February	16,923,607	46,468,050
March	18,853,824	48,897,275
April	18,310,791	43,700,630

*As of April 30, 1928.
Rubber Association figures representing 75 per cent of the industry.

U. S. Rubber Consumption 1926-1927

	1926 Tons	1927 Tons
January	32,194	31,517
February	31,125	30,137
March	32,935	36,141
April	32,695	35,871
May	29,364	34,592
June	28,599	33,801
July	27,577	29,219
August	34,535	33,460
September	32,904	27,214
October	29,837	26,790
November	28,080	26,792
December	26,295	25,381
Totals	366,140	370,915

Ceylon Rubber Exports

January 1 to March 31, 1928

	Tons
To United Kingdom	3,058.98
Continent	866.26
Australia	214.27
America	7,960.97
Egypt	3.00
Africa	4.22
India	5.77
Japan	43.90
Other countries in Asia	3.40
Total	12,160.77
For the same period last year	17,371.00

ANNUAL EXPORTS 1921-1927

	Tons
For the year 1927	55,355.77
1926	58,799.56
1925	45,597.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

MARKET REVIEWS

CRUDE RUBBER

The Rubber Exchange of New York, Inc.

TRANSACTIONS on the Rubber Exchange from May 25 to June 23 inclusive were 10,136 lots, equivalent to 26,340 tons. This turnover compares with 16,495 lots or 41,237½ tons done from April 25 to May 23, inclusive.

Summarized by weeks, the market features were as follows: The week closed May 26 showed a steady demand on the part of manufacturers for crude rubber, but generally their bids were below the daily quotations resulting in only a moderate amount of business. Prices had a slight upward tendency during the week. September gained 30 points while July, December and January finished unchanged on May 26.

The market of the week ended June 2 reflected a feeling of uncertainty in the trade based more or less on the reports from London that much rubber is accumulating on the estates which will be free for shipment following November 1. The rate at which stocks have been reduced for the past two to three months controverts the belief that there will be no undue surplus of rubber next winter but perhaps the reverse with prices higher than at present. On June 4, July closed at 19.20 to 19.30 while March and April were unchanged. January at 19.30 asked showed a 30 point advance.

The week closed June 9 with a very strong undertone. Trading throughout this period was moderate in volume with price range on all positions very narrow, and mostly in the hands of the professionals. Far eastern offerings were generally above New York prices. June 9, December and May advanced 10 points to 19.40, and January and March at 19.30 were unchanged.

For week terminated June 16 the market closed with prices distinctly above those of the previous week. Consuming interests bought steadily at fair prices but trading on the Exchange was generally dull. On June 16 there was a downward movement in which October and November were 19.10, a loss of 40 points from the previous close.

The week which closed June 23 was without features of note. There was scarcely enough activity to maintain interest by the traders. Prices were strong enough to withstand all efforts at depression. Nearby positions held firmly but distant futures closed slightly below their prices of the previous week. In the trading on June 23, July held a 10 point gain for a while, but dropped it at the close.

Trading Limits Reduced

On June 1, owing to the greater stability of the rubber market, the Rubber Exchange reduced the trading limit on all future contracts from 8 to 5 cents. The former limit of 8 cents was in effect from March 12, 1926. At that time with rubber selling over 60 cents a pound, a limit of 8 cents was not too large, but today with prices around 20 cents and the Exchange functioning perfectly, it is considered that a trading range of 5 cents, otherwise 500 points, either way is sufficient to give the necessary freedom and range of price movement.

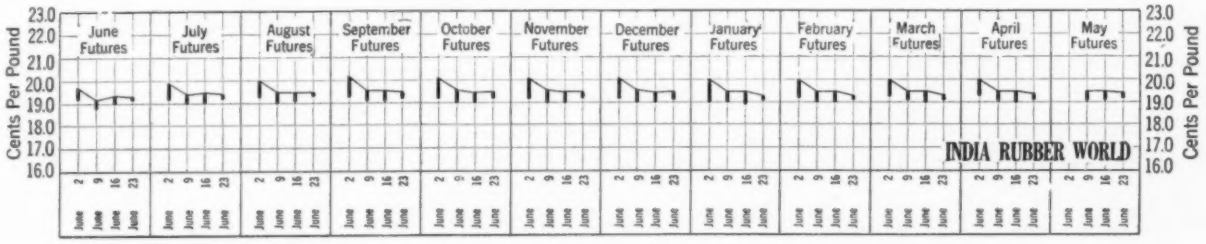
No Saturday Closing

The Board of Governors of the Rubber Exchange has decided against a proposal to close the Exchange on Saturdays during July and August, deeming it contrary to the interests of members and their customers to deny them the opportunity of buying and selling on Saturdays.

Akron Ticker Service

Ten brokerage houses and rubber companies with offices in Akron, O., made application to the Rubber Exchange for installation of exchange tickers and the furnishing of continuous quotations of the rubber market.

New York Rubber Exchange—High and Low Monthly Futures



The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLOSING PRICES—CENTS PER POUND

1928	May 25	26	28	29	30*	31	June 1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
May	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
June	19.3	19.3	19.7	19.3	....	19.2	19.2	19.2	18.8	18.9	19.2	19.1	19.2	19.1	19.0	19.0	19.1	19.4	19.2	19.0	19.2	19.2	19.3	19.3	19.2	19.2
July	19.4	19.5	19.9	19.5	....	19.3	19.3	19.2	19.0	19.0	19.4	19.1	19.2	19.2	19.0	19.0	19.2	19.5	19.3	19.1	19.2	19.3	19.4	19.4	19.3	19.3
August	19.5	19.7	20.0	19.6	....	19.4	19.3	19.3	19.0	19.1	19.5	19.2	19.2	19.3	19.1	19.3	19.2	19.5	19.4	19.1	19.2	19.3	19.4	19.5	19.4	19.3
September	19.5	19.8	20.2	19.7	....	19.4	19.3	19.4	19.1	19.1	19.6	19.3	19.3	19.4	19.2	19.1	19.3	19.6	19.6	19.1	19.2	19.4	19.5	19.5	19.4	19.4
October	19.6	19.8	20.1	19.6	....	19.4	19.2	19.3	19.0	19.1	19.6	19.3	19.3	19.4	19.1	19.0	19.3	19.5	19.5	19.1	19.2	19.3	19.4	19.5	19.4	19.4
November	19.6	19.8	20.1	19.6	....	19.4	19.2	19.3	19.0	19.1	19.6	19.3	19.3	19.4	19.1	19.0	19.3	19.5	19.5	19.1	19.2	19.3	19.4	19.5	19.4	19.4
December	19.6	19.7	20.1	19.6	....	19.4	19.2	19.3	19.0	19.1	19.6	19.2	19.3	19.4	19.0	19.0	19.3	19.5	19.4	19.1	19.1	19.2	19.4	19.5	19.3	19.4
1929																										
January	19.6	19.7	20.0	19.6	....	19.4	19.0	19.3	19.0	19.0	19.5	19.2	19.3	19.3	18.9	19.0	19.3	19.5	19.4	19.1	19.1	19.1	19.3	19.3	19.2	19.1
February	19.6	19.7	20.0	19.6	....	19.4	19.2	19.3	19.0	19.1	19.5	19.2	19.3	19.3	19.0	19.0	19.3	19.5	19.4	19.1	19.1	19.2	19.3	19.3	19.2	19.2
March	19.7	19.7	20.0	19.6	....	19.4	19.3	19.3	19.1	19.1	19.5	19.2	19.3	19.3	19.0	19.0	19.3	19.5	19.3	19.1	19.1	19.2	19.3	19.3	19.2	19.3
April	19.7	19.7	20.0	19.6	....	19.4	19.3	19.3	19.1	19.1	19.5	19.3	19.3	19.3	19.1	19.0	19.3	19.5	19.4	19.1	19.1	19.3	19.3	19.4	19.2	19.2
May	....	....	....	....	....	....	19.3	19.5	19.1	19.1	19.5	19.3	19.3	19.4	19.2	19.2	19.4	19.5	19.4	19.1	19.2	19.3	19.2	19.4	19.2	19.2

*Holiday.

The applicants were: Miller Rubber Co.; Prince & Whitely; Harriss, Irby & Vose; Harron, Rodenbaugh & Meyer; H. W. French Co.; Meyer & Brown, Inc.; C. T. Wilson & Co.; Goodyear Tire & Rubber Co.; General Tire & Rubber Co.; and The B. F. Goodrich Co. Quotations from the New York exchange will be printed on the tickers in Akron within six or seven seconds after the transactions are made on the trading floor. This will enable traders in Akron to keep in constant touch with the activities of the New York market.

Rule Limiting Credit Extensions

On June 19 the Board of Governors of the Rubber Exchange gave notice of the adoption of a new rule, prohibiting, under penalty of suspension or expulsion, the extension of credit to customers in excess of $1,000. This rule, effective October 1 next, is believed to be the most drastic of its kind ever adopted by a commodity exchange. The new rule is designed to safeguard rubber trading, discourage unwarranted speculation in rubber and encourage hedging by manufacturers and producers.

F. R. Henderson, president of the Rubber Exchange, made the following statement in regard to the adoption of the rule:

"The Board of Governors long considered incorporating in the rules a provision prohibiting the extension of credits, but deemed it wise to defer action until such time as the Rubber Exchange was as firmly established as it is today. While the new rule may appear severe, it is believed that it will prove one of the most progressive steps in safeguarding futures trading and encouraging use of trade insurance hedging facilities, which has ever been taken by any commodity market. This move to further elevate the standard of trading on the Rubber Exchange already has the endorsement of conservative commission houses and representatives of leading rubber dealers."

The new rule reads as follows: "Rule 59. The extension of credit or credits in excess of $1,000 (exclusive of commissions) to a customer, whether a member or non-member, in connection with the purchase and/or sale of rubber on the Rubber Exchange, is declared to be an act detrimental to the best interests of the Exchange, and is hereby prohibited. Any equity which a customer may have in his account with the member in connection with trading in or ownership of any other commodities or securities may be applied in payment of variation margins to the extent to which such equity may be available beyond the requirements for margins on such other commodities or securities. Any member knowingly violating the provisions of this rule shall be subject to suspension or expulsion under Section 43 of the By-Laws."

New York Outside Market

In general the outside market between May 23 and June 23 passed through steadily quiet conditions in which factory buyers ideas ran consistently ¼ cent below the sellers' prices. First latex was quoted steadily at ¼ cent above ribs. "B" blanket, No. 1 brown and No. 1 roll brown were in good demand and advanced steadily in price because of increasing shortage. On June 25 they were quoted as follows: "B" blanket 19¼ cents up 1¼ cents from May 26. No. 1 brown 19 cents up 1 cent from May 26. No. 1 roll brown, 18½ cents up 1½ cents. First latex is being held at a premium of ¼ cent over ribs. On June 26 spot ribs were firm at 19⅝ in a quiet market.

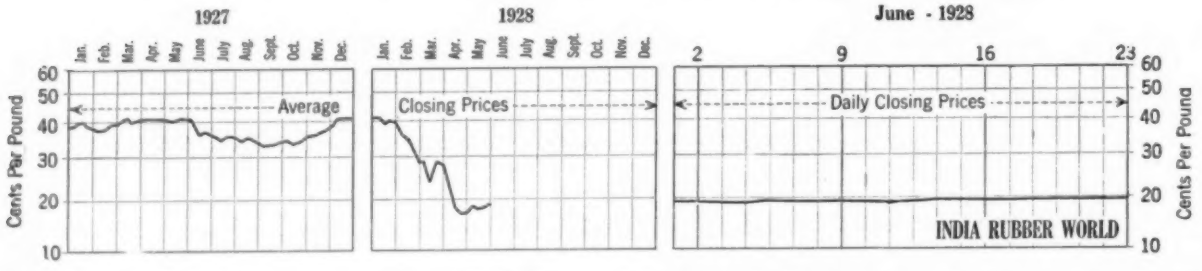
Considered by weekly periods the general market features were as follows: For the week ended May 26 the market was very steady with firm undertone without much factory buying. Consumers were bidding under the market in expectation of a break but none occurred. Ambers, brown crepe and roll brown grades became very scarce. Dealers were not inclined to sell nearby rubber except at prices above the market.

The week closed June 2 exhibited considerable strength with prices steady, until Friday when selling pressure depressed prices. The drop however did not reach the levels of consumers' views and business was difficult to transact. Decrease in London stock began to have its influence; factories were taking nearby rubber and prices became firmer.

The market for the week terminated June 9 was rated as a tame affair. Consumers held off with their ideas ½ cent under sellers' offerings. On Wednesday and Thursday prices declined about ⅜ cents in an attempt to lower the primary market. The factories, however, did not follow up with buying orders.

For the week closed June 16 the market was quiet although some good factory

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	May, 1928										June, 1928													
PLANTATIONS	21	22	23	24	25	26	28	29	*30	31	1	2	4	5	6	7	8	9	11	12	13	14	15	16
Sheet																								
Ribbed smoked	18⅛	18⅛	19	19	19½	19½	20	19⅞	...	19½	19⅜	19⅜	19¼	19⅜	19⅜	19⅜	19⅜	19⅜	19¼	19⅜	19⅜	19⅝	19⅝	19½
Crepe																								
First latex	18⅞	18⅞	19⅛	19½	19⅝	19⅝	20⅛	20	...	19¾	19½	19⅝	19¾	19⅜	19⅞	19½	19½	19½	19⅜	19⅜	19½	19¾	19¾	19¾
No. 2 blanket	17⅞	18	18⅛	18⅜	18¾	18¾	19¼	19¼	...	18¾	18¾	18¾	18⅜	18⅜	19	18⅝	18⅝	18⅝	18½	18⅜	18⅝	19	19	18⅞
No. 3 blanket	17⅜	17½	17½	17⅞	18⅛	18⅛	18⅞	18⅝	...	18⅜	18⅜	18⅜	18⅛	18	18⅝	18⅜	18⅜	18⅜	18⅛	18¼	18⅜	18½	18½	18½
No. 4 blanket	17	17⅛	17¼	17½	18	17⅞	18½	18½	...	18	17⅞	18	17¾	17⅝	18¼	18	18⅛	18⅛	18	18	18⅛	18⅛	18¼	18¼
Thin clean brown	17½	17⅝	17½	17⅞	18⅜	18½	18⅞	18¾	...	18½	18⅜	18⅜	18¼	18	18½	18⅜	18⅜	18⅜	18⅛	18¼	18⅜	18⅜	18⅝	18⅝
Rolled brown	16¾	16½	16⅞	17	17½	17⅜	18⅜	18	...	17⅝	17½	17⅝	17⅜	17¼	18	18⅛	18¼	18¼	18⅛	17⅞	18⅛	18¼	18¼	18¼
Off latex	18½	18⅝	18⅜	18⅜	19⅜	19⅜	20	19¾	...	19½	19¼	19⅜	19⅛	19⅜	19½	19¼	19¼	19¼	19⅛	19⅛	19¼	19⅝	19½	19⅜

*Holiday.

buying appeared for late June and July. Their general attitude was still that of outwaiting the market hoping for a break. Declines, however, were not in prospect.

During the week terminated June 23 the same quiet conditions prevailed as in the week previous. Demand was scattered with buyers difficult to locate. Eastern offerings were high making trading at a profit out of the question. The market therefore remained steady and quiet.

Paras were in steady demand throughout the month with supplies light and prices firm. Balatas were dull and neglected.

Importations of all grades in May were 32,883 tons, compared with 36,569 tons one year ago. Plantation arrivals for May were 31,564 tons, compared with 33,735 tons one year ago. Total importations of plantation rubber for five months ended May 31 were 176,737 tons compared with 180,664 tons for the corresponding period of 1927. Total importations of all grades of rubber for five months ended May 31 were 186,705 tons, compared with 193,656 tons for the corresponding period of 1927.

RUBBER AFLOAT TO THE UNITED STATES

(All figures in long tons)

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
May 26..	4,404	435	1,409	2,921	9,169
June 2...	3,799	1,020	1,306	1,094	7,219
June 9...	4,629	209	1,373	490	6,701
June 16..	3,335	326	1,652	1,020	6,333
June 23..	3,787	266	1,708	2,270	8,031

London

In the interval from May 23 to June 23 the London market was generally active with prices for the most part steady. Advances in price overbalanced the declines as indicated by the record for spot ribs, the closing bids on which were May 23, 8⅞ pence; June 1, 9½ pence; June 14, 9⅜ pence and June 25, 9½ pence. On the same dates the respective bid prices on ribs for July-September were 9, 9½, 9½ and 9½ pence. For October-December position the bids on the same dates stood 9⅛, 9⅝, 9½ and 9⅝ pence respectively.

At the end of May there was a heavy falling off in far eastern shipments because Chinese dealers ceased by reason of low prices to carry on trade with the native producers of the Dutch East Indies. The outlook is good for a marked increase of rubber consumption in England and continental Europe during the present year because of the rapid displacement of solid tires by balloon and giant pneumatics adopted for the rapidly extending bus lines. Another growing

New York Quotations

FOLLOWING ARE THE NEW YORK OPEN MARKET RUBBER QUOTATIONS FOR ONE YEAR AGO, ONE MONTH AGO AND JUNE 25, THE CURRENT DATE.

	June 25, 1927	May 25, 1928	June 25, 1928
Plantation Hevea			
Rubber Latex (Hevea)..gal.	$1.50 @	$1.50 @	$1.50 @
CREPE			
First latex, spot	.37 @	.19¼ @	.19⅞ @.20
July	.37 @.37⅛	.19¼ @	.19⅞ @
August-September	.37¼ @	.19½ @	.19⅞ @
October-December	.37⅜ @.37½	.19¾ @	.19¾ @.19⅞
January-March	.38 @	.20 @	.19¾ @
Off latex, spot	.36½ @.36¾	.19 @	.19½ @
"B" Blanket, spot	.33½ @.34	.18¼ @	.19¼ @
July	.34 @	.18¼ @	.19¼ @
August-September	.34 @	.18½ @	.19¼ @
October-December	.34⅛ @	.18¾ @	.19¼ @
January-March	.34½ @	.19 @	.19⅛ @
"C" Blanket, spot	.32½ @	.17¼ @	.18¾ @
Brown No. 1	.32 @	.17¾ @	.19 @
Brown No. 2	.31½ @	.17¼ @	.18⅞ @
Brown, roll	.31½ @	.17 @	.18½ @
Sheet			
Ribbed, smoked spot	.36½ @.36¾	.19 @	.19¼ @
July	.36½ @	.19⅛ @	.19⅜ @.19¼
August-September	.36⅞ @	.19⅜ @	.19⅜ @.19¾
October-December	.37½ @	.19¾ @	.19⅝ @.19¾
January-March	.37¾ @	.19⅞ @	.19¾ @
East Indian			
PONTIANAK			
Banjermassin	.09¾ @	.09 @.09¾	.09½ @
Pressed block	.16 @	.14¾ @.15	.14½ @
Sarawak	.09¾ @	.09¾ @	.09½ @
South American			
PARAS			
Upriver, fine	*.31 @	.20 @	.22 @
Upriver, fine	*.42 @	*.26 @	*.26½ @
Upriver, medium	.26 @	.18 @	@
Upriver, coarse	.21 @	.14¼ @	.15 @
Upriver, coarse	*.34 @	*.22 @	*.22½ @
Islands, fine	.39 @	@	@
Islands, fine	*.40 @	*.25 @	*.26 @
Acre, Bolivian, fine	.32 @	.20 @	.23 @
Acre, Bolivian, fine	*.43 @	*.26 @	*.27 @
Beni, Bolivian	.32 @	.20½ @	.23½ @
Madeira, fine	.31 @	.19½ @	.22 @
Peruvian, fine	.30½ @	.19 @	.21½ @
Tapajos, fine	.30 @	.18 @	.20½ @

	June 25, 1927	May 25, 1928	June 25, 1928
South American			
CAUCHO			
Upper caucho ball	.22 @	.14 @	.14 @
Upper caucho ball	*.34 @	*.22 @	*.22½ @
Lower caucho ball	.19¼ @	.13 @	.13½ @
Maniçobas			
Ceará negro heads	.22 @	†.17 @	†.17 @
Ceará scrap	.12 @	†.09 @	†.09 @
Manicoba, 30% guaranteed	.21 @	†.19 @	†.19 @
Mangabiera, thin sheet	.21 @	†.19 @	†.19 @
Centrals			
Central scrap	.22½ @	.16 @	.15½ @
Central wet sheet	.17 @	.12 @	.08 @
Corinto scrap	.22 @	.16 @	.15½ @
Esmeralda sausage	.22 @	.16 @	.15½ @
Guayule			
Duro, washed and dried	.30 @	.20 @	.20 @
Ampar	.@	.21 @	.21 @
Gutta Percha			
Gutta Siak	.22 @	.18 @	.18 @
Gutta Soh	.43 @	.30 @.32	.27 @
Gutta Macassar	3.20 @	2.80 @3.00	2.60 @2.90
Balata			
Block, Ciudad Bolivar	.37 @	.38 @	.39 @
Colombia	.36 @	.44 @	.39 @
Manaos block	.41 @	.44 @	.42 @
Panama	.36 @	.44 @	.44 @
Surinam, sheet	.60 @	.50 @.51	.50 @
Amber	.64 @	.52 @	.54 @
Chicle			
Honduras	‡.68 @	‡.64 @	‡.68 @
Yucatan, fine	‡.68 @	‡.64 @	‡.68 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

New York Outside Market—Spot Closing Rubber Prices—Cents, Per Pound

PLANTATIONS	June, 1928 18	19	20	21	22	23
Sheet						
Ribbed smoked	19½	19½	19¾	19⅝	19⅝	19⅝
Crepe						
First latex	19⅝	19¾	19⅞	19⅞	19¾	19¾
No. 2 blanket	19	19⅛	19⅛	19⅛	19	19⅛
No. 3 blanket	18½	18¾	18⅞	19	18¾	19
No. 4 blanket	18¼	18½	18⅝	18¾	18½	18¾
Thin clean brown	18⅜	18¾	18⅞	19	18¾	19
Rolled brown	18⅛	18⅜	18¾	18⅝	18½	18⅜
Off latex	19⅛	19½	19¾	19⅜	19½	19½

Low and High New York Spot Prices

PLANTATIONS	1928*	June 1927	1926
First latex crepe	$0.19⅜ @$0.20½	$0.35¼ @$0.41¼	$0.41 @$0.45
Smoked sheet, ribbed	.19¼ @ .20¼	.34¾ @ .41¼	.41½ @ .45
PARAS			
Upriver, fine	.20 @ .23½	.30 @ .37	.34 @ .38
Upriver, coarse	.14¾ @ .16½	.20 @ .26	.20 @ .24½
Islands, fine	.....	.26½ @ .32	.34 @ .35

*Figured to June 23, 1928.

outlet for rubber is in tires for the increasingly popular small cars which are becoming very numerous.

The weekly record of London stocks since March 24 is as follows:

1928	Tons	1928	Tons
March 31	58,197	May 19	48,705
April 7	58,732	May 26	44,628
April 14	58,945	June 2	43,716
April 21	56,819	June 9	42,683
April 28	53,360	June 16	41,185
May 5	52,015	June 23	40,083
May 12	50,837		

Singapore

The course of the Singapore market followed closely the market in London. It was mostly steady and dull with prices gradually rising as the month progressed. On June 2 rubber futures closed steady in tone with June and October-December ⅛ down at 9¼ pence and July-September unchanged at 9¼ pence. On June 16 futures closed steady. All positions were down ⅛ at 9⅛ pence. On June 23, the market closed steady. July and October-December were 9¼ pence and July-September futures were down ¼ at 9⅜ pence.

The Federated Malay States Government official estimate for the current restriction year of standard production of rubber from the restriction area of Malaya is 314,575 tons.

Rubber Scrap

A VERY active demand for tire and shoe scrap prevailed during June. The margin of stocks in excess of the demand is not excessive because collections from points far distant from the central markets are not available owing to high freight rates. The price of boot and shoe scrap is getting so low that it is practically impossible to trade in it. Only old accumulations are being sold and it does not pay dealers to replace their stock of this grade.

A similar situation prevails with regard to solid tire scrap. It is being accumulated incidentally to the salvaging of steel tire bases, the rubber being disposed of only as urgency of storage space requires it. It is said that in certain sections rubber scrap can be sold as fuel at greater profit than for reclaiming.

Mechanical, air brake hose and mixed black scrap remain unchanged at normal levels.

New York Quotations
Carload Lots
June 25, 1928

Tires		
Pneumatic Standard—		
Mixed auto tires with beads	ton	$22.00 @$23.00
Beadless	ton	29.00 @30.00
White auto tires with beads	ton	40.00 @42.00
Beadless	ton	50.00 @52.00
Mixed auto peelings	ton	32.00 @34.00
Solid—		
Mixed motor truck, clean	ton	18.00 @20.00
Inner Tubes		
No. 1, floating	lb.	.06½ @ .06¾
No. 2, compounded	lb.	.03¾ @ .04
Red	lb.	.04¾ @ .05
Mixed tubes	lb.	.03½ @ .03¾
Boots and Shoes		
Boots and shoes, black	lb.	.01¾ @ .01¾
Red and white	lb.	.00½ @ .00¾
Trimmed arctics, black	lb.	$0.00½ @$0.00¾
Untrimmed arctics	lb.	.00½ @ .00¾
Tennis shoes and soles	lb.	.00¾ @ .01
Hard Rubber		
No. 1 hard rubber	lb.	.06 @ .07½
Battery jars, black compound	lb.	.01 @ .01½
Mechanicals		
Mixed black scrap	lb.	.00½ @ .00¾
Heels	lb.	.00½ @ .00¾
Hose, air brake	ton	20.00 @25.00
regular soft	ton	15.00 @16.50
No. 1 red	lb.	.02 @ .02½
No. 2 red	lb.	.01 @ .01¾
White, druggists' sundries	lb.	.02 @ .02½
Mechanical	lb.	.01½ @ .01¾

Reclaimed Rubber

THE virtual stabilization of crude rubber around 19 cents during June has not affected the general demand for the standard grades of reclaims. Prices for the list in general remain unchanged, except in the cases of dark gray and white auto tires and high tensile black. These have decreased very slightly. Two grades only have advanced in similar degree, namely, inner tube reclaims Nos. 1 and 2.

The general situation shows increased business for reclaimers during both May and June. Reclaims always experience more active trade in those months than in any others because of seasonal increase of rubber goods output. The June demand, however, was not only better than that of May but greater than that of June one year ago.

Auto tire grades quite naturally make up the bulk of the demand with the prices unchanged on all grades except for dark gray and white tires, which register a decline of ½ cent each. Tube reclaim and shoes follow tires in that order in volume of consumption as reported by the larger reclaimers. White, gray and red miscellaneous qualities are selling better than solid tire reclaim, which is less in demand than any other. Solid tire reclaim seems to be a favorite with manufacturers of mechanical rubber goods where its physical properties overbalance in consideration the point of heavy gravity.

The prices of all reclaim grades are lower than their intrinsic merit justifies. Competition is keen and the market is wholly in favor of the buyer.

New York Quotations
June 25, 1928

Auto Tire	Specific Gravity	Price Per Pound
Black	1.21	$0.07¾ @$0.08
Black, washed	1.18	.09½ @ .10
Black selected tires	1.18	.08¼ @ .08½
Dark gray	1.35	.09¾ @ .10
Light gray	1.38	.12 @ .12½
White	1.40	.13½ @ .14
High Tensile		
Super-reclaim—		
No. 1 black	1.20	.13½ @ .14
No. 2 black	1.20	.11¾ @ .12
High tensile red	1.20	.13¾ @ .14

Shoe	Specific Gravity	Price Per Pound
Unwashed	1.60	$0.07¼ @$0.07½
Washed	1.50	.10 @ .10¼
Tube		
No. 1	1.00	.15 @ .15½
No. 2	1.10	.11 @ .11½
Miscellaneous		
Red	1.35	.13½ @ .14
Truck tire, heavy gravity	1.55	.07¼ @ .07½
Truck tire, light gravity	1.40	.07¾ @ .08
Mechanical blends	1.60	.07 @ .08

Stocks of Rubber at End of Month—Long Tons

	1927 December	1928 January	February	March	April	May
Producing Centers						
Singapore	21,761	22,240	19,360	17,813	14,685	14,946
Penang	4,037	3,628	3,507	2,725	2,261	2,741
Para	1,526	1,585	2,782	1,815	2,277	2,429
Total, long tons	27,324	27,453	25,649	22,353	19,223	20,116
Manufacturing Centers						
London	63,793	66,524	62,964	58,272	53,425	44,628
Liverpool	2,468	2,136	2,343	2,133	(1)	(1)
Amsterdam	857	909	931	973	1,145	(1)
Antwerp	81	25	30	100	119	(1)
United States (on hand)	100,131	110,243	108,955	114,060	113,083	105,357
World (afloat)	67,400	69,380	68,700	63,100	(1)	(1)
Total, long tons	234,730	249,217	243,923	238,638	(1)	(1)
Grand total, long tons	262,054	276,670	269,572	260,991	(1)	(1)

(1) Not available.

COMPOUNDING INGREDIENTS

THE demand for those compounding ingredients that make up the bulk of the tonnage used by the rubber trade seems to be steadily growing notwithstanding that some reduction in the general output of tires is said to have taken place. Probably, also, manufacturers are reducing costs by recompounding and utilizing the rubber conserving effect possible with a number of the popular low price ingredients.

ACCELERATORS. The occasional appearance of some new accelerator does not appreciably lessen the demand for the familiar well established brands. These are steadily meeting with increased favor.

ANTI-OXIDANTS. The run of rubber manufacturing companies, outside of the leaders, apparently take the attitude that anti-oxidants are a luxury and seem more interested in effecting the saving possible by omitting them than in making goods of lasting quality. However, new anti-oxidants appear and doubtless will gain increasing appreciation.

BENZOL. There is a good volume of inquiry. Prices are steady and production showing some decline due to lessened production of coke.

CARBON BLACK. There has been no change in prices and the demand holds up well.

CLAY. The production of rubber compounding clays is not far in excess of the demand. In some instances there is difficulty in meeting the call for goods.

DEGRAS. Appreciation of the value of degras as a softener and dispersion medium is growing as reflected by the demand.

LITHARGE. Early in June the price advanced 25 cents a hundred. The guarantee against a price decline up to September 30 has not stimulated demand.

LITHOPONE. Production of 1927 is reported as 176,994 tons as compared to 159,931 tons in 1926. Contracts are being made for the second half year at no advance in price.

MINERAL RUBBER. The demand is taxing the facilities of output to meet it.

SOLVENT NAPHTHA. The demand by the rubber industry is steady at unchanged prices.

V. M. & P. NAPHTHA. The market is firm with steady demand for spot delivery at steady prices.

STEARIC ACID. This dependable stabilizer of cure is being increasingly appreciated in the rubber industry and fortunately is maintained at a low price level.

ZINC OXIDE. Probably no rubber manufacturer is without his supply of this invaluable material which is recognized as an indispensable agent for stimulating to action nearly every accelerator. The demand improved in June and the price held firmly.

New York Quotations

June 25, 1928

Accelerators, Inorganic			
Lead, carbonate	lb.	$0.08½	@
Lead, red	lb.	.09¼	@
sublimed white	lb.	.07¼	@
sublimed blue	lb.	.07¼	@
super-sublimed white lead	lb.	.08¼	@
Lime, R. M. hydrated	ton	13.50	@
Litharge	lb.	.08¾	@
Magnesia, calcined	lb.	.0375	@
calcined, heavy	lb.	.04	@
carbonate	lb.	.06	@ .07
Orange mineral A.A.A.	lb.	.11¾	@
Accelerators, Organic			
A-7	lb.	.55	@ .65
A-11	lb.	.62	@ .75
A-16	lb.	.57	@ .65
A-19	lb.	.58	@ .75
A-20	lb.	.64	@ .80
Aero X	lb.	.60	@
Aldehyde ammonia	lb.	.65	@ .70
B. B.	lb.		@
Captax	lb.		@
Crylene, hard form	lb.		@
Paste	lb.		@
Di-ortho-tolylguanidine	lb.	.48	@ .50½
D. P. G.	lb.	.40	@ .42½
Ethylidine aniline	lb.	.45	@ .47½
Formaldehyde aniline	lb.	.31	@ .35½
Grasselerator 102	lb.	.62½	@ .67½
552	lb.	4.45	@
808	lb.	1.00	@ 1.10
833	lb.	1.40	@ 1.55
Heptene	lb.		@
Hexamethylene tetramine	lb.	.57½	@ .60
Lead oleate, No. 999	lb.	.14¾	@
Witco	lb.	.13	@
Methylene dianiline	lb.	.37	@
Monex	lb.		@
Piperidine pentamethylene dithio carbamate	lb.	4.45	@ 4.60
Plastone	lb.	.36	@
R. & H. 40	lb.	.40	@ .42½
50	lb.	.40	@ .42½
Safex	lb.		@
Super-sulphur, No. 1	lb.		@
No. 2	lb.		@
Tensilac No. 39	lb.	.50	@ .52½
No. 41	lb.	.50	@ .52½
Thermlo F	lb.	.50	@ .55
Thionex	lb.	3.25	@
Thiocarbanilid	lb.	.23	@ .32
Trimene	lb		@
base	lb.		@
Triphenylguanidine	lb.	.65	@ 67½
Tuads	lb		@
Vulcanex	lb	.62	@
Vulcanol	lb.	.92	@
Vulcone	lb	.62	@
ZBX	lb.		@
Z-88	lb.	.50	@ .60
Zimate	lb.		@
Acids			
Acetic 28% (bbls.)	100 lbs.	3.37½	@ 3.62½
glacial (carboys)	100 lbs.	12.41	@ 12.66
Sulphuric, 66°	100 lbs.	1.60	@
Alkalies			
Caustic soda, solid	lb.	$0.03	@
Anti-Oxidants			
Age-Rite, powder	lb.		@
resin	lb.		@
Antox	lb.		@
Neozone	lb.	.74	@
A	lb.	.67	@
Oxynone	lb.	.68	@ .90
Resistox	lb.	.54	@ .65
Stabilite	lb.	.65	@
V. G. B.	lb.		@
Colors			
BLACK			
Bone	lb.	.08	@ .09
Carbon (see compounding ingredients)			
A. & W. nonfli No. 1	lb.	.40	@
Drop	lb.	.06	@ .10
Lampblack (commercial)	lb.	.09	@
BLUE			
A. & W. blue	lb.	1.25	@ 5.00
Du Pont, N.	100 lbs.	1.35	@
Marine, A. C.	100 lbs.	1.30	@
5 R.	100 lbs.	1.00	@
2 G.	100 lbs.	.90	@
Huber Brilliant	lb.	4.20	@ 4.70
Prussian	lb.	.31	@ .35
Ultramarine	lb.	.06	@ .25
BROWN			
Huber Mocha	lb.	1.60	@ 2.10
Sienna, Italian, raw	lb.	.05½	@ .12½
GREEN			
A. & W. green	lb.	1.25	@ 3.00
Chrome, light	lb.	.27	@ .31
medium	lb.	.28	@ .31
Du Pont, A. C.	100 lbs.	3.00	@
4 G.	100 lbs.	.60	@
G. L.	100 lbs.	30	@
Y. L.	100 lbs.	.75	@
Huber Brilliant	lb.	4.35	@
Oxide of chromium	lb.	.28	@ .40
ORANGE			
Du Pont, 2 R.	100 lbs.	1.40	@
R. X.	100 lbs.	1.30	@
Y. O.	100 lbs.	1.60	@
Huber Persian	lb.	.50	@ 1.00
RED			
A. & W. red	lb.	0.75	@ 3.50
purple	lb.	2.00	@ 4.00
Antimony, golden, No. 40	lb.		@
No. 60	lb.	.16	@ .20
golden 15/17%	lb	.21	@ .23
Aristi	lb.	2.75	@
Huber Brilliant	lb.	1.35	@ 1.85
Colors—(Continued)			
RED			
Antimony			
Crimson, R.M.P. No. 3	lb.	$0.50	@ $0.55
Sulphur free	lb.	.55	@ .65
7-A.	lb.	.35	@
Z-2	lb.	.22	@
Vermilion, No. 5	lb.		@
No. 15	lb.		@
Du Pont, R. I.	100 lbs.	1.75	@
6 B.	100 lbs.	.90	@
Brilliant A. C.	100 lbs.	.90	@
Iron Oxides			
bright pure domestic	lb.	.12	@
bright pure English	lb.	.11	@ .14
bright reduced English	lb.	.08½	@ .10
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.11	@
Indian (maroon), reduced English	lb.	.07½	@ .09
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¾	@
Spanish red oxide	lb.	.03	@ .04¼
Sunburnt red	lb.	.14	@
Venetian reds	lb.	.02	@ .06
Vermilion, Eng. quicksilver	lb.	1.88	@
WHITE			
Lithopone	lb.	.05½	@ .05⅞
Albalith	lb.		@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.	.05¼	@ .05¾
Sterling	lb.		@
Vanolith	lb.	.05½	@
Titanox	lb.	.10	@ .10½
Zinc Oxide			
AAA (lead free)	lb.	.07	@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06¼	@ .06⅞
Z (8% leaded)	lb.	.06⅛	@ .06⅞
French Process			
Green seal	lb.	.10⅞	@
Red seal	lb.	.09⅞	@
White seal	lb.	.11⅞	@
Kadox	lb.		@
XX	lb.		@
YELLOW			
A. & W. yellow	lb.	2.00	@ 4.00
Cadmium sulphide	lb.	.90	@ 1.10
Chrome	lb.	.16	@ .17
Du Pont N.	100 lbs.	4.00	@
R. W.	100 lbs.	.78	@
Grasselli cadmium	lb.		@
Huber canary	lb.	3.30	@ 3.80
Ochre, domestic	lb.	.01½	@ .02½
Oxide, pure	lb.	.08¾	@
Zinc imported	lb.	.25	@
Compounding Ingredients			
Aluminum flake (sacks, c.l.)	ton	21 85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carbon'te powd.	lb.	.11	@
lump	lb.	.10	@
Asbestine	ton	13.40	@ 14.50
Barium, carbonate	ton	60.00	@

Compounding Ingredients *(Continued)*

Barytes, imported	ton	$32.50	@
dry ground, white	ton	35.00	@
dry ground, off color	ton	27.50	@
No. 1 Missouri, water ground and floated, St. Louis	ton	23.00	@
Basofor	lb.	.04½	@
Blanc fixe, dry	lb.	.03½	@
pulp	ton	40.00	@
Carbon Black			
Aerfloted arrow	lb.	.08 @	.12
Compressed	lb.	.07½ @	.11½
Uncompressed	lb.	.07 @	.11
Micronex	lb.	.08 @	.12
Carrara filler	ton	20.00	@
Chalk, precipitated	lb.	.04¼ @	.04¾
Clay, Blue Ridge, dark	ton		@
Blue Ridge, light	ton		@
China	lb.	.01¼	@
Dixie	ton		@
Langford	ton		@
Mineral flour (Florida)	ton		@
Perfection	ton	14.00	@
Suprex	ton	.08 @	.20
Tensulite	ton	14.00 @	25.00
Cotton flock, black	lb.	.13	@
light-colored	lb.	.09 @	.10
white	lb.	.11 @	.28
Glue, high grade	lb.	.24 @	.28
low grade	lb.	.21 @	.25
Infusorial earth	ton	50.00	@
Mica, amber (fact'y)	ton	80.00	@
Pumice stone, powd	lb.	.02½ @	.04
Rotten stone (bbls.)	lb.	.02½ @	.04½
Soap bark	lb.	.15½ @	.16
Soapstone	ton	15.00 @	22.00
Talc, domestic	ton	15.00	@
French	ton	18.00 @	22.00
Pyrax A	ton		@
B	ton		@
Thermatomic carbon	lb.		@
Velvetex	lb.	.04 @	.07
Whiting:			
Commercial	100 lbs.	1.00	@
English, cliffstone	100 lbs.	1.50	@
Quaker	ton		@
Snow white	ton		@
Sussex	ton		@
Vancolloid	ton	27.00	@
Vansulite	ton	17.40 @	26.00
Westminster Brand	100 lbs.		@
Witco (c.l.) (fact'y)	ton	12.00	@
Whiting, imp. chalk	100 lbs.	.90 @	1.00
Paris White, Eng. Cliff	100 lbs.	1.50 @	2.50

Factice—See Rubber Substitutes

New York Quotations

June 25, 1928

Mineral Rubber

Fluxrite (solid)	lb.	$0.05	@$0.06
Genasco (fact'y)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Hydrocarbon, soft	ton		@
Ohmlac Kapak, M. R.	ton	35.00	@90.00
M-4	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granulated	ton	52.00	@54.00
Robertson, M. R., solid (fact'y)	ton	34.00	@80.00
M. R. gran. (fact'y)	ton	38.00	@80.00
Vansul Puro	ton	27.00	@33.00

Oils

Mineral	gal.	.18	@
Kerosene	gal.	.15	@
Rapeseed	gal.	.89	@
Red oil, distilled	lb.	.09¾ @	.10¼
Rubber process	gal.	.28	@
Spindle	gal.	.35	@

Rubber Substitutes or Factice

Black	lb.	.08 @	.14
Brown	lb.	.07½ @	.15
White	lb.	.08½ @	.16

Softeners

Burgundy pitch	100 lbs.	6.00	@
Atlas	100 lbs.	6.50	@
Corn oil	lb.	.10½	@
Cotton oil	lb.	.10½	@
Cycline oil	gal.	.27 @	.34
Degras	lb.	.03¾ @	.04½
Fluxrite (fluid)	lb.	.05 @	.06
Hexalin	lb.	.60	@
acetate	lb.	.70	@
Moldrite	lb.	.07 @	.07½
Palm oil (Lagos)	lb.	.09½	@
Palm oil (Niger)	lb.	.09	@
Palm oil (Witco)	lb.	.08½	@
Para-flux	gal.	.17	@
Petrolatum, snow white	lb.	.08¾ @	.09
Pigmentar	gal.	.33 @	.39
Pine oil, steam distilled	gal.	.69 @	.70
Rosin K	bbl.	9.95	@
Rosin oil, compounded	gal.	.30	@
No. 3	gal.	.55	@
No. 556	gal.	.48	@
Rubite	lb.	.10½	@
Rubtack	lb.	.08½	@
Shellac, orange	lb.	.70 @	

Softeners—*(Continued)*

Stearex	lb.	$0.10 @	$0.14
Stearic acid, double press'd.	lb.	.11¼ @	.12¾
Tackol	lb.	.09 @	.15
Tar (retort)	bbl.	12.50 @	13.00
Tasco W-S No. 1	lb.	.06	@
A	lb.	.05	@
Vansulol	lb.	.10½	@
Vantar (Pine Tar)	gal.	.35	@
Waxene	lb.	.30 @	.40
Woburn oil	lb.	.05½ @	.07

Solvents

Benzol (90%, 7.21 lbs. gal.)	gal.	.27 @	.28
Carbon bisulphide (99.9%, 10.81 lbs. gal.) (drums)	lb.	.05 @	.06
tetrachloride (99.7%, 13.28 lbs. gal.) (drums)	lb.	.07 @	.07½
Gasoline No. 303			
Tankcars	gal.	.18	@
Drums, c. l.	gal.	.28	@
Drums, l. c. l.	gal.	.40	@
Dip-Sol	gal.	.12	@
Rubberlene	gal.	.11	@
Rub-Sol	gal.	.09½	@
Solvent naphtha	gal.	.35	@
Sweet rubber cement naphtha	gal.	.15	@
Turpentine, Venice	lb.	.20	@
steam distilled	gal.	.53 @	.54

Vulcanizing Ingredients

Sulphur			
Velvet flour (240 lb. bbls.)	100 lbs.	2.95 @	3.50
(150 lb. bags)	100 lbs.	2.60 @	3.15
Soft rubber (c.l.)	100 lbs.	2.40 @	2.75
(l.c.l.)	100 lbs.	@	
Superfine commercial flour (210 lb. bbls.)	100 lbs.	2.55 @	3.10
(100 lb. bags)	100 lbs.	2.20 @	2.80
Tire brand, superfine	100 lbs.	1.90 @	2.25
Tube brand, velvet	100 lbs.	2.40 @	2.75
Sulphur chloride	lb.	.03¼ @	.03½
Vandex (selenium)	lb.	@	

(See also Colors—Antimony)

Waxes

Beeswax, white, com	lb.	.55	@
carnauba	lb.	.33	@
ceresine, white	lb.	.12	@
montan	lb.	.07½	@
ozokerite, black	lb.	.27	@
green	lb.	.28	@
Paraffin			
122/124 white crude scale	lb.	.05	@
124/126 white crude scale	lb.	.05	@
123/125 fully refined	lb.	.04¾	@
125/127 fully refined	lb.	.05¼	@

Industrial Illness and Its Cure

A business is organized and conducted for the purpose of making profits. Failure to attain this object in increasingly greater measure indicates something wrong, in fact, it marks the onset of a case of illness which unchecked will bring a fatal result. Every concern can benefit by a periodic overhauling to keep it out of a rut and insure healthy growth. Otherwise its faulty functioning will develop to the detriment of the owners' interests.

The conditions symptomatic of a drift toward disaster are as follows: For years the old established concern may have been showing only a small profit. Then as operations continue, small but persistent losses appear. This does not please the bank and the line of credit becomes gradually meager and finally is actually withdrawn. The only resource then is to sell the receivables to a discount company.

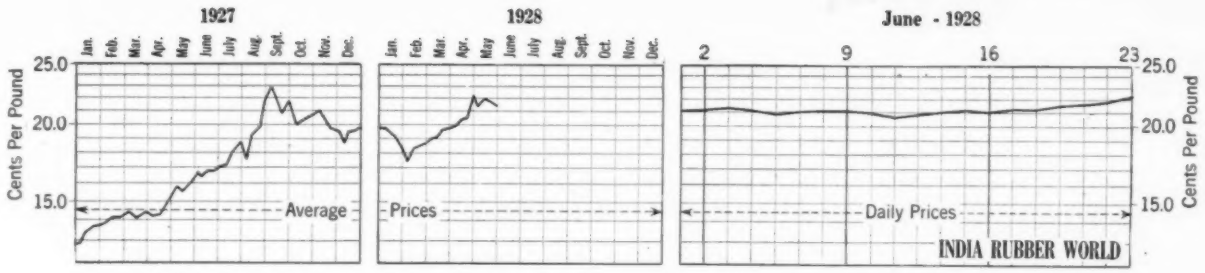
Operating and maintenance charges become excessive and correspondingly depressing upon profits. To complicate matters the management is growing gray in the service. Sales do not increase but the cost of making them does. The cost of the goods cannot go lower or quality and reputation will suffer.

In the operating departments the machinery is obsolescent and steadily wearing out with no funds to replace it by new labor saving machinery. The superintendent and foremen are not only aging but, because they have never seen another plant in their line, they make the serious error of believing that the old shop and old methods can still compete effectively in the present day.

The cumulative result of conditions such as these is comprised in one word—bankruptcy. If the management is not blind to fate it will promptly advise with some business engineer and technical expert competent to study the situation, reveal the underlying faults and apply the remedy. Fortunately there are available for this work men of sound training, clear insight and resourcefulness to set sick companies on the road to recovery whether in the rubber industry or any other.

Ramie and Silk Cord Tires

Tests are being made in Great Britain of balloon tires in the carcasses of which the usual cords of cotton are replaced with cords of ramie or rhea, which material is rated as much stronger than cotton. The use of ramie has often been urged as a cord or fabric building material, but its cost and restricted supply have discouraged experimenting. A better method of retting the ramie plant and new mechanism for the separation of the fine fibers of the stems, it is said, are quite well developed and may soon result in a lower price and extensive cultivation. The British Dunlop Rubber Co. has a process for using both ramie and artificial silk. Yarns for tire cords may be made by mixing the two materials in the proportion of about 75 per cent of ramie and 25 of artificial silk and spinning them together; or cords may be formed of strands of ramie fiber twisted with strands of artificial silk. British Patent No. 262,256, Nov. 28, 1925.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Cotton and Fabrics

AMERICAN COTTON. The price for middling spot cotton on June 1 was 21.05 cents compared with 22.30 cents on May 1. On June 14 it was 21.00 cents, and 22.05 cents on the 25th. A month ago the crop outlook was such that the market hesitated to advance beyond the 21 cent level, awaiting the weather effect in the cotton areas.

By the middle of June the crop outlook was not very promising, demand was slack and liquidation became the leading feature of the price situation. Prices were, however, steady under these unfavorable influences, and gradually improved with the continuation of the poor or indifferent field outlook.

A marked advance in price was evident on June 23 when for the first time in the month it passed 22 cents as it became evident that the usual crop improvement of June had failed to materialize.

EGYPTIAN COTTON. Little change has taken place in the staple cotton situation during the past 30 days and neither buyers nor sellers have seemed anxious to do business. American staples continue to maintain their cheapness as compared with other growths. Most of the very cheap lots are offered on actuals and are of poor character. The recent unfavorable weather has affected the staple producing areas more than any other and unless a decided improvement shall have occurred previous to July 1 the price situation will change very rapidly.

Both Egyptian and Pima crops are reported to be making normal progress. There is a good trade demand for selected staple Egyptians and Pimas even at the present high prices, but medium and poor staples are not wanted. The Alexandria futures market would probably be considerably higher were it not for the probability of tenders of medium staple cottons.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. Raw cotton is advancing rapidly with premium applicable for white stock over June-August deliveries. Fabric prices are far below a parity with cotton but are rising slowly. The demand for ducks, drills and osnaburgs is appreciably improved over that prevailing a month ago and higher prices are in prospect.

RAINCOAT FABRICS. The raincoat trade has improved considerably during the past month. Twills and plaids for the Trench coat, which at present is the outstanding style, have been selling rapidly. The double texture raincoat is coming rapidly into favor and plaids and prints are in demand for their manufacture.

SHEETINGS. The market is fairly active with prices becoming stiffer owing to the advance in raw cotton.

TIRE FABRICS. Tire fabric mills operated at full production during June. Early in the month inquiries from tire manufacturers were rather limited in number and amount, most of the orders placed being routine. About the 13th of the month tire price reductions created much interest and encouragement in tire fabric circles, over a half million pounds of fabric being sold within a few days. This was divided between carded peeler and Egyptian grades. Tire fabric consumption for June was reported as considerably in excess of that of June a year ago. In the week ended the 23rd, 100,000 pound orders were accumulating at the fabric mills but without embarrassment to production.

Tire fabric mill management is reported to be somewhat concerned about the need to stabilize prices and combat competition offered by those tire manufacturing concerns who are producing fabric in excess of their own needs.

New York Quotations

June 25, 1928

Drills

38-inch 2.00-yard	yard	$0.18 @
40-inch 3.47-yard		.10⅝ @
50-inch 1.52-yard		.25 @
52-inch 1.90-yard		.20 @
52-inch 2.20-yard		.17¾ @
59-inch 1.85-yard		.19½ @

Ducks

38-inch 2.00-yard D. F.	yard	.19½ @
40-inch 1.45-yard S. F.		.26¼ @
72-inch 1.05-yard D. F.		.38 @
72-inch 16.66-ounce		.41⅜ @
72-inch 17.21-ounce		.43 @
MECHANICAL		
Hose and belting	pound	.37 @
Specials		.40 @
TENNIS		
52-inch 1.35-yard	yard	.29 @

Hollands

RUBBER TRADE SPECIAL R. T. J A.		
31-inch	yard	.15 @
40-inch		.20 @
RED SEAL		
36-inch		.15½ @
40-inch		.16½ @
50-inch		.25 @
GOLD SEAL		
40-inch, No. 72		.20¾ @
40-inch, No. 80		.22 @

Osnaburgs

40-inch 2.35-yard	yard	$0.15¼ @
40-inch 2.48-yard		.14⅞ @
40-inch 3.00-yard		.12⅝ @
37-inch 2.42-yard		.15⅜ @

Raincoat Fabrics

COTTON		
Bombazine 64 x 60	yard	.11¼ @
Bombazine 60 x 48		.10½ @
Plaids 60 x 48		.12½ @
Plaids 48 x 48		.11½ @
Surface prints 64 x 60		.13 @
Surface prints 60 x 48		.12½ @
Print cloth 38½-in., 60 x 64		.07⅛ @

Sheetings, 40-inch

48 x 48, 2.50 yard	yard	.12¼ @	.12½
48 x 48, 2.85-yard		.11 @	.11⅛
64 x 68, 3.15 yard		.12 @	
56 x 60, 3.60-yard		.09¾ @	.09⅞
44 x 48, 3.75-yard		.08⅞ @	.09

Sheetings, 36-inch

48 x 48, 5.00 yard	yard	.07 @
40 x 44, 6.15-yard		.05 @

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	pound	@
Peeler, karded		$0.47 @
BUILDER 23/11		
Peeler, karded	pound	.46 @
BUILDER 10/5		
Peeler, karded	pound	.42 @
CORD 23/5/3		
Egyptian, combed	pound	@
Egyptian, karded		@
Peeler, karded, 1 1/32-in		.45 @
CORD 23/4/3		
Peeler, karded	pound	.46 @
CORD 23/3/3		
Peeler, karded	pound	.52 @
CORD 15/3/3		
Peeler, karded	pound	.43 @
CORD 13/3/3		
Peeler, karded	pound	.42 @
LENO BREAKER		
8-oz. Peeler, karded	pound	.47 @
10-oz. Peeler, karded		.47 @
CHAFER		
9.5-oz. Peeler, karded	pound	.44 @
12-oz. Peeler, karded		.43 @
14-oz. Peeler, karded		.42 @

United States Rubber Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	March, 1928		Three Months Ended March, 1928	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	91,142,083	$32,109,376	254,149,491	$90,151,475
Balata	71,978	26,460	205,621	82,843
Jelutong or Pontianak	1,856,824	388,616	4,076,289	714,942
Gutta percha	256,899	57,833	1,292,176	359,620
Guayule	1,287,600	365,927	3,352,300	889,561
Rubber scrap	1,552,203	89,511	6,154,480	248,484
Totals	96,167,587	$33,037,723	269,230,357	$92,446,925
Chicle *dutiable*	1,766,280	$884,428	5,435,557	$2,773,540
MANUFACTURED—*Dutiable*				
Rubber belting	50,605	$32,679	130,225	$73,719
Rubber tires	204	3,679	976	28,126
Other manufactures of rubber	.....	143,813	.....	392,498
Totals	50,809	$180,171	131,201	$494,343

EXPORTS OF FOREIGN MERCHANDISE

RUBBER MANUFACTURES				
Crude rubber	5,887,553	$1,838,577	16,475,754	$5,803,156
Balata	26,797	9,753	79,693	33,169
Gutta percha and rubber substitutes and scrap	19,940	1,714	112,482	12,281
Rubber manufactures	.....	50,589	.....	81,954
Totals	5,934,290	$1,900,633	16,667,929	$5,930,560

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India Rubber				
Reclaimed	1,968,618	$145,697	5,775,564	$437,691
Scrap and old	4,466,437	265,029	12,667,128	767,675
Footwear				
Boots *pairs*	55,617	158,009	201,469	502,055
Shoes *pairs*	100,390	76,005	394,952	329,216
Canvas shoes with rubber soles *pairs*	443,008	327,243	1,255,247	942,168
Rubber water bottles and fountain syringes *number*	25,725	13,690	77,708	48,682
Rubber gloves *doz. pairs*	7,121	20,573	21,705	66,223
Other druggists' rubber sundries	.....	28,651	.....	95,769
Rubber balloons *gross*	62,571	73,561	146,916	168,342
Rubber toys and balls	.....	16,898	.....	31,342
Bathing caps *doz.*	39,080	83,028	64,408	139,034
Hard rubber goods				
Electrical hard rubber goods	113,115	23,912	401,448	87,725
Other hard rubber goods	.....	22,443	.....	86,732
Tires				
Casings, automobile *number*	233,983	3,090,398	603,532	7,829,486
Tubes, automobile *number*	160,988	355,369	415,870	888,297
Other casings and tubes, *number*	7,439	13,824	13,111	26,450
Solid tires for automobiles and motor trucks *number*	6,153	216,116	15,107	539,509
Others	183,626	42,678	585,064	132,203
Tire accessories	.....	209,530	.....	448,836
Rubber and friction tape	157,989	47,078	322,198	100,581
Belting	498,452	288,402	1,489,966	808,409
Hose	700,237	233,090	1,912,229	675,990
Packing	325,513	142,940	815,210	365,833
Soles and heels	152,292	246,046	353,886	532,623
Thread	164,034	184,718	416,179	471,934
Rubber bands and erasers	76,048	49,253	209,153	142,314
Other rubber manufactures	.....	1,000,896	.....	1,339,086
Totals	.....	$7,375,077	.....	$18,004,205

Crude Rubber Imports by Customs Districts

	*April, 1928		Four Months Ended *April, 1928	
	Pounds	Value	Pounds	Value
Massachusetts	4,063,151	$1,285,912	17,213,435	$5,523,450
New York	65,985,329	21,055,041	286,731,737	99,730,356
Philadelphia	3,971,902	1,157,913	7,630,324	2,413,231
Maryland	7,617,619	2,649,841	13,390,973	4,742,845
Los Angeles	2,465,159	831,647	10,887,431	3,879,457
San Francisco	128,338	37,695	348,853	110,322
Oregon	49,280	16,865	82,980	28,668
Ohio	518,201	173,218	2,382,737	820,529
Wisconsin	.....	.....	280,000	110,749
St. Louis	56,000	21,982	56,000	21,982
Colorado	170,000	66,232	170,000	66,232
Totals	85,024,979	$27,296,346	339,174,470	$117,447,821

*Including latex, dry rubber content.

London Stocks, April, 1928

LONDON	Landed for April Tons	Delivered† for April Tons	Stocked April 30 1928 Tons	1927 Tons	1926 Tons
Plantation	8,216	13,039	53,285	66,686	18,604
Other grades	....	31	88	133	119
LIVERPOOL					
Plantation	†862	†510	†2,485	†2,901	†1,260
Total tons, London and Liverpool	9,078	13,580	55,858	69,720	19,983

†Official returns from the six recognized public warehouses.

United Kingdom Rubber Statistics

IMPORTS

UNMANUFACTURED Crude Rubber From—	April, 1928 Pounds	April, 1928 Value	Four Months Ended April, 1928 Pounds	Four Months Ended April, 1928 Value
Straits Settlements	6,347,600	£265,902	32,425,100	£1,973,702
Federated Malay States	5,260,900	231,716	17,441,500	1,021,413
British India	1,039,800	45,978	5,915,600	383,304
Ceylon and Dependencies	2,027,100	90,349	10,561,300	682,246
Other Dutch possessions in Indian Seas	2,186,900	106,180	9,297,700	607,170
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,109,100	90,250	10,746,100	675,389
Other countries in East Indies and Pacific not elsewhere specified	227,900	9,743	1,202,400	77,354
Brazil	304,000	13,062	1,783,300	103,120
South and Central America (except Brazil)	39,800	1,773	131,400	7,149
West Africa:				
French West Africa	42,100	2,080	50,200	2,503
Gold Coast	36,200	1,578	204,800	12,458
Other parts of West Africa	258,900	13,610	674,300	39,524
East Africa, including Madagascar	187,300	8,666	552,800	33,981
Other countries	219,200	9,352	540,600	29,600
Totals	20,286,800	£890,239	91,527,100	£5,648,913
Waste and reclaimed rubber	735,300	10,111	3,590,600	49,743
Gutta percha and balata	230,700	18,379	1,272,000	110,802
Rubber substitutes	6,500	216	10,900	321
Totals	21,259,300	£918,945	96,400,600	£5,809,779
MANUFACTURED				
*††Tires and tubes				
Pneumatic				
Outer covers	.....	£84,682	.....	£275,492
Inner tubes	.....	14,379	.....	52,345
Solid tires	.....	4,938	.....	20,547
Boots and shoes *doz. pairs*	89,541	135,021	291,371	483,014
Other rubber manufactures	.....	190,787	.....	687,902
Totals	.....	£429,807	.....	£1,519,300

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	2,713,400	£19,890	11,435,600	£96,020
Rubber substitutes	27,400	743	173,000	4,542
Totals	2,740,800	£20,633	11,608,600	£100,562
MANUFACTURED				
‡Tires and tubes				
Pneumatic				
Outer covers	.....	£176,944	.....	£729,637
Inner tubes	.....	29,075	.....	135,419
Solid tires	.....	18,536	.....	83,123
Boots and shoes *doz. pairs*	25,656	35,886	75,091	115,894
Other rubber manufactures	.....	270,528	.....	1,001,750
Totals	.....	£530,969	.....	£2,065,823

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED Crude Rubber To—	April, 1928 Pounds	April, 1928 Value	Four Months Ended April, 1928 Pounds	Four Months Ended April, 1928 Value
Russia	1,333,800	£87,817	3,243,700	£252,517
Sweden, Norway and Denmark	239,000	16,988	841,600	64,855
Germany	4,430,400	264,099	15,044,400	1,074,711
Belgium	1,040,300	70,649	3,188,800	233,400
France	2,376,300	152,870	9,423,100	711,059
Spain	173,200	11,836	789,900	64,367
Italy	626,400	41,732	4,390,100	333,719
Other European countries	432,000	33,614	1,530,800	136,619
United States	14,615,100	918,457	39,209,200	2,776,177
Canada	.....	.....	4,600	571
Other countries	127,800	8,449	504,400	39,270
Totals	25,394,300	£1,606,511	78,170,600	£5,687,265
Waste and reclaimed rubber	10,000	152	90,200	1,588
Gutta percha and balata	60,700	5,721	335,000	29,667
Rubber substitutes	.....	.....	1,100	35
Totals	25,465,000	£1,612,384	78,596,900	£5,718,555
MANUFACTURED				
*‡Tires and tubes				
Pneumatic				
Outer covers	.....	£16,642	.....	£47,975
Inner tubes	.....	8,078	.....	14,847
Solid tires	.....	22	.....	1,205
Boots and shoes *doz. pairs*	745	1,601	2,975	6,837
Other rubber manufactures	.....	21,551	.....	53,092
Totals	.....	£47,894	.....	£123,956

*After April 12, 1927, tires and tubes imported or exported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

†Motor cars, motorcycles, parts and accessories, liable to duty from September 29, 1915, until August 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

‡Tires and tubes included prior to April 12, 1927.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

CASES

MAY 16. By "Steel Seafarer," Far East.
H. A. Astlett & Co. 2,007
Baird Rubber & Trading Co., Inc. 375
General Rubber Co. 4,769
Hood Rubber Co. 132
Littlejohn & Co., Inc. 1,695
The Meyer & Brown Corp. 1,426
Poel & Kelly, Inc. 550
Charles T. Wilson Co., Inc. 515

MAY 17. By "Anchoria," Far East.
Bierrie & Co., Inc. 50
General Rubber Co. 630
The Meyer & Brown Corp. 330
H. Muehlstein & Co., Inc. 56

MAY 18. By "Algic," Far East.
General Rubber Co. 106
Littlejohn & Co., Inc. 762
The Meyer & Brown Corp. 50
Poel & Kelly, Inc. 210
Charles T. Wilson Co., Inc. 149

MAY 19. By "City of Florence," Far East.
H. A. Astlett & Co. 3,165
Baird Rubber & Trading Co., Inc. 150
Bierrie & Co., Inc. 734
General Rubber Co. 4,184
Littlejohn & Co., Inc. 3,833
The Meyer & Brown Corp. 1,451
The Meyer & Brown Corp. *153
H. Muehlstein & Co., Inc. 1,410
Poel & Kelly, Inc. 220
Raw Products Co. 210
Rogers Brown & Crocker Bros., Inc. 901
Charles T. Wilson Co,. Inc. 729

MAY 19. By "Malayan Prince," Far East.
Poel & Kelly, Inc. *150

MAY 19. By "Mississippi," London.
General Rubber Co. ‡15,962

MAY 19. By "Niew Amsterdam," Europe.
Littlejohn & Co., Inc. 72

MAY 20. By "Korea Maru," Far East.
H. Muehlstein & Co., Inc. †164

MAY 20. By "Pres. Jackson," Far East.
Littlejohn & Co., Inc. †110
H. Muehlstein & Co., Inc. †458
Poel & Kelly, Inc. †400

MAY 21. By "Carmania," London.
General Rubber Co. 235
Littlejohn & Co., Inc. 22
The Meyer & Brown Corp. 56
Poel & Kelly, Inc. 577

MAY 21. By "Dacre Castle," Far East.
H. A. Astlett & Co. 1,195
Baird Rubber & Trading Co., Inc. 100
General Rubber Co. 5,607
Haldane & Co., Inc. 68
Hood Rubber Co. 140
Littlejohn & Co., Inc. 1,439
The Meyer & Brown Corp. 1,184
H. Muehlstein & Co., Inc. 500
Poel & Kelly, Inc. 600
Poel & Kelly, Inc. *250
Raw Products Co. 325
Rogers Brown & Crocker Bros., Inc. 960
Charles T. Wilson Co., Inc. 867

MAY 21. By "Kabinga," Far East.
Baird Rubber & Trading Co., Inc. 380
General Rubber Co. 1,330
Littlejohn & Co., Inc. 504
H. Muehlstein & Co., Inc. 360
Rogers Brown & Crocker Bros., Inc. 479
Charles T. Wilson Co., Inc. 290

MAY 21. By "Minnesota," London.
Baird Rubber & Trading Co., Inc. 3,898
Bierrie & Co., Inc. 674
The Meyer & Brown Corp. 1,022
Charles T. Wilson Co., Inc. 106

MAY 21. By "Silverbelle," Far East.
H. A. Astlett & Co. 869
Baird Rubber & Trading Co., Inc. 100
Bierrie & Co., Inc. 250
General Rubber Co. 5,130
Hood Rubber Co. 150
Littlejohn & Co., Inc. 3,415
The Meyer & Brown Corp. 1,623
H. Muehlstein & Co., Inc. 790
Rogers Brown & Crocker Bros., Inc. 1,121
Charles T. Wilson Co., Inc. 628

MAY 21. By "West Sequenna," Far East.
The Meyer & Brown Corp. †400

MAY 22. By "Malayan Prince," Far East.
H. A. Astlett & Co. 150
Baird Rubber & Trading Co., Inc. 170
General Rubber Co. 1,386
Littlejohn & Co., Inc. 653
The Meyer & Brown Corp. 407
H. Muehlstein & Co., Inc. 400
Poel & Kelly, Inc. 558
Rogers Brown & Crocker Bros., Inc. 1,526
Charles T. Wilson Co., Inc. 150

MAY 22. By "Scythia," Liverpool.
Baird Rubber & Trading Co., Inc. 104
The Meyer & Brown Corp. 30

MAY 25. By "Carinthia," London.
H. Muehlstein & Co,. Inc. 180

MAY 27. By "City of Dunkirk," Far East.
Baird Rubber & Trading Co., Inc. 250
N. Diamond & Co., Inc. 50

MAY 27. By "Raby Castle," Far East.
Baird Rubber & Trading Co,. Inc. 100
General Rubber Co. 1,220
Haldane & Co., Inc. 368
Littlejohn & Co., Inc. 1,199
The Meyer & Brown Corp. 471
H. Muehlstein & Co., Inc. 200
Poel & Kelly, Inc. 350
Rogers Brown & Crocker Bros., Inc. 100
Charles T. Wilson Co., Inc. 407

MAY 28. By "City of Durham," Far East.
H. A. Astlett & Co. 1,123
General Rubber Co. 1,567
Haldane & Co., Inc. 300
Hood Rubber Co. 102
Littlejohn & Co., Inc. 840
The Meyer & Brown Corp. 1,173
The Meyer & Brown Corp. *50
H. Muehlstein & Co. 265
Poel & Kelly, Inc. 150
Rogers Brown & Crocker Bros., Inc. 674

MAY 28. By "Clan Kenneth," Far East.
Littlejohn & Co., Inc. 200
Raw Products Co. 371
Charles T. Wilson & Co., Inc. 104

MAY 28. By "Lancastria," Europe.
H. A. Astlett & Co. 250
General Rubber Co. 29
Rogers Brown & Crocker Bros., Inc. 20

MAY 28. By "Minnetonka," London.
Baird Rubber & Trading Co., Inc. 3,690
Bierrie & Co., Inc. 770
General Rubber Co. 50
Haldane & Co., Inc. 151
Littlejohn & Co., Inc. 90
The Meyer & Brown Corp. 843
H. Muehlstein & Co., Inc. 241
Rogers Brown & Crocker Bros., Inc. 756
Charles T. Wilson Co., Inc. 83

MAY 28. By "Pres. Garfield," Far East.
H. A. Astlett & Co. 300
Baird Rubber & Trading Co., Inc. 280
Bierrie & Co., Inc. 50
General Rubber Co. 1,424
Hood Rubber Co. *299
Littlejohn & Co., Inc. 1,185
The Meyer & Brown Corp. 1,010
H. Muehlstein & Co., Inc. 385
Poel & Kelly, Inc. 500
Raw Products Co. 150
Rogers Brown & Crocker Bros., Inc. 800

MAY 28. By "Silver Fir," Far East.
The Meyer & Brown Corp. †210
Poel & Kelly, Inc. †480

MAY 29. By "Singapore Maru," Far East.
H. A. Astlett & Co. 160
H. Muehlstein & Co., Inc. 396

MAY 31. By "Comeric," Far East.
Bierrie & Co., Inc. 50
General Rubber Co. 785
Littlejohn & Co., Inc. 1,512

MAY 31. By "Vechtdyk," Far East.
H. A. Astlett & Co. 1,133
Baird Rubber & Trading Co., Inc. 60
Bierrie & Co., Inc. 176
General Rubber Co. 2,732
Hood Rubber Co. *265
Littlejohn & Co., Inc. 1,860
The Meyer & Brown Corp. 319
H. Muehlstein & Co., Inc. 400
Poel & Kelly, Inc. 261
Charles T. Wilson Co., Inc. 404

JUNE 1. By "Elpenor," Far East.
H. A. Astlett & Co. 415
Bierrie & Co., Inc. 150
General Rubber Co. 2,702
Littlejohn & Co., Inc. 963
The Meyer & Brown Corp. 706
H. Muehlstein & Co., Inc. 300
Raw Products Co. 50
Rogers Brown & Crocker Bros., Inc. 542
Charles T. Wilson & Co., Inc. 400

CASES

JUNE 3. By "Deli," Far East.
H. A. Astlett & Co. †192

JUNE 3. By "Pres. McKinley," Far East.
Littlejohn & Co., Inc. †110

JUNE 4. By "American Trader," London.
Baird Rubber & Trading Co., Inc. 521

JUNE 4. By "Caronia," Europe.
H. A. Astlett & Co. 112
General Rubber Co. 13,312
Littlejohn & Co., Inc. 29

JUNE 4. By "Deutschland," Europe.
N. Diamond & Co., Inc. 144

JUNE 4. By "Minnekahda," London.
Baird Rubber & Trading Co,. Inc. 406
Bierrie & Co., Inc. 351
N. Diamond & Co., Inc. 350
General Rubber Co. 129
Littlejohn & Co., Inc. 1,070
The Meyer & Brown Corp. 401
H. Muehlstein & Co., Inc. 650
Raw Products Co. 274
Rogers Brown & Crocker Bros., Inc. 40
Charles T. Wilson Co., Inc. 41

JUNE 4. By "Tosari," Far East.
H. A. Astlett & Co. 1,378
Baird Rubber & Trading Co., Inc. 280
Bierrie & Co., Inc. 61
General Rubber Co. 3,773
Hood Rubber Co. *202
Littlejohn & Co., Inc. 2,298
The Meyer & Brown Corp. *139
The Meyer & Brown Corp. 251
H. Muehlstein & Co., Inc. 155
Poel & Kelly, Inc. 185
Rogers Brown & Crocker Bros., Inc. 513

JUNE 6. By "Marengo," Far East.
General Rubber Co. 264

JUNE 6. By "Masirah," Far East.
Baird Rubber & Trading Co., Inc. 730
Bierrie & Co., Inc. 56
General Rubber Co. 1,042
Littlejohn & Co., Inc. 287
Rogers Brown & Crocker Bros., Inc. 142
Charles T. Wilson Co., Inc. 25

JUNE 8. By "Beemsterdijk," Amsterdam.
Baird Rubber & Trading Co., Inc. *348

JUNE 8. By "Missouri," Far East.
Rogers Brown & Crocker Bros., Inc. *205

JUNE 8. By "Schodack," Europe.
H. A. Astlett & Co. 134

JUNE 8. By "Venice Maru," Far East.
H. A. Astlett & Co. 862
Baird Rubber & Trading Co., Inc. 100
General Rubber Co. 3,478
Littlejohn & Co., Inc. 1,873
The Meyer & Brown Corp. 1,585
H. Muehlstein & Co,. Inc. 110
Poel & Kelly, Inc. 420
Rogers Brown & Crocker Bros., Inc. 890
Charles T. Wilson Co., Inc. 255

JUNE 9. By "London Mariner," London.
General Rubber Co. ‡13,238

JUNE 11. By "American Shipper," London.
Baird Rubber & Trading Co., Inc. 266
Littlejohn & Co., Inc. 258

JUNE 11. By "Breedyk," Europe.
General Rubber Co. 42
Haldane & Co., Inc. 80

JUNE 11. By "City of Hereford," Far East.
General Rubber Co. 56
Littlejohn & Co., Inc. 810
The Meyer & Brown Corp. 168
The Meyer & Brown Corp. *224
Raw Products Co. 112

JUNE 11. By "City of Lincoln," Far East.
Baird Rubber & Trading Co., Inc. 104
General Rubber Co. 1,456
Littlejohn & Co., Inc. 168
The Meyer & Brown Corp. 75
Raw Products Co. 104
Rogers Brown & Crocker Bros., Inc. 104
Charles T. Wilson Co., Inc. 246

JUNE 11. By "Minnewaska," London.
H. A. Astlett & Co. 140
Baird Rubber & Trading Co,. Inc. 2,253
Bierrie & Co., Inc. 1,366
General Rubber Co. 150
Haldane & Co., Inc. 153
Littlejohn & Co., Inc. 1,151
The Meyer & Brown Corp. 1,122
H. Muehlstein & Co., Inc. 141
Charles T. Wilson Co., Inc. 57

JUNE 11. By "Steel Scientist," Far East.
H. A. Astlett & Co. 1,805
Baird Rubber & Trading Co., Inc. 160
General Rubber Co. 3,296
Haldane & Co., Inc. 200
Littlejohn & Co., Inc. 2,220
The Meyer & Brown Corp. 1,000
Poel & Kelly, Inc. 271
Rogers Brown & Crocker Bros., Inc. 427
Rogers Brown & Crocker Bros., Inc. *192
Charles T. Wilson Co,. Inc. 170

*Arrived at Boston.
†Arrived at Los Angeles.
‡Arrived at Philadelphia.

	Cases
JUNE 11. By "Samaria," Liverpool.	
Baird Rubber & Trading Co., Inc.	90
Littlejohn & Co., Inc.	98
JUNE 11. By "Silversprucе," Far East.	
General Rubber Co.	†100
JUNE 11. By "Tuscania," London.	
Haldane & Co., Inc.	150
Poel & Kelly, Inc.	250
JUNE 12. By "Celtic," Liverpool.	
Bierrie & Co., Inc.	152
JUNE 12. By "Pres. Harrison," Far East.	
Baird Rubber & Trading Co., Inc.	50
N. Diamond & Co., Inc.	50
General Rubber Co.	1,508
Hood Rubber Co.	*102
Littlejohn & Co., Inc.	1,265
The Meyer & Brown Corp.	360
The Meyer & Brown Corp.	*150
H. Muehlstein & Co., Inc.	465
Poel & Kelly, Inc.	300
Rogers Brown & Crocker Bros., Inc.	450
Rogers Brown & Crocker Bros., Inc.	*305

*Arrived at Boston.

	Cases
JUNE 12. By "Teiresias," Far East.	
Baird Rubber & Trading Co., Inc.	330
General Rubber Co.	2,722
Littlejohn & Co., Inc.	629
The Meyer & Brown Corp.	683
H. Muehlstein & Co., Inc.	785
Poel & Kelly, Inc.	100
Rogers Brown & Crocker Bros., Inc.	209
JUNE 14. By "Siberia Maru," Far East.	
Littlejohn & Co., Inc.	†100
JUNE 15. By "Silverhazel," Far East.	
Haldane & Co., Inc.	250
Littlejohn & Co., Inc.	1,918
H. Muehlstein & Co., Inc.	1,341

Africans

MAY 22. By "Saco," Antwerp.	
Hood Rubber Co. ....bales	*195
Hood Rubber Co. ....bags	*84
JUNE 7. By "Collamer," Europe.	
Littlejohn & Co., Inc.	74

	Cases
Balata	
MAY 31. By "Denis," Peru.	
Paul Bertuch & Co., Inc.	35
Guayule	
MAY 21. By "Stal," Mexico.	
Continental Rubber Co. of New York	1,620
MAY 29. By "Cauto," Mexico.	
Continental Rubber Co. of New York	2,779
JUNE 4. By "Agwistar," Mexico.	
Continental Rubber Co. of New York	2,180
JUNE 12. By "Panuco," Mexico.	
Continental Rubber Co. of New York	1,823
Rubber Latex	
MAY 16. By "Steel Seafarer," Far East.	
General Rubber Co. ....gal.	66,076
MAY 28. By "Pres. Garfield," Far East.	
Rogers Brown & Crocker Bros., Inc. gal	*204
JUNE 11. By "Steel Scientist," Far East.	
General Rubber Co. ....gal.	64,434

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
MAY 14. By "Lalande," Brazil.					
H. A. Astlett & Co.	...	...	73	...	...
MAY 28. By "Ardenhall," Brazil.					
H. A. Astlett & Co.	5	...	229	210	...
Paul Bertuch & Co., Inc.	165	...	...	...	...
General Rubber Co.	...	...	...	...	*21
Littlejohn & Co., Inc.	...	...	119	...	...
MAY 31. By "Denis," Brazil.					
H. A. Astlett & Co.	24	...	2	172	...
Paul Bertuch & Co., Inc.	293	74	6	684	...
General Rubber Co.	103	50	99	558	†4
Littlejohn & Co., Inc.	253	...	11	...	...
JUNE 11. By "Aidan," Brazil.					
H. A. Astlett & Co.	...	...	...	146	...
Paul Bertuch & Co., Inc.	50	14	...	60	...
General Rubber Co.	139	12	...	...	...
Littlejohn & Co., Inc.	63	4	133	...	...

*Cameta. †Mixed.

United States Crude and Waste Rubber Imports for 1928 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1928	Total 1927	Balata	Miscellaneous	Waste
January ....tons	43,668	1,580	433	126	435	1	46,243	45,827	120	1,292	248
February	27,852	756	125	125	587	..	29,445	27,701	58	517	310
March	37,545	2,430	72	92	755	..	40,894	35,054	154	741	830
April	36,108	573	15	20	524	..	37,240	48,632	202	888	18
May	31,564	849	14	5	451	..	32,883	36,285	71	923	142
Total, five months, 1928....tons	176,737	6,188	659	368	2,752	1	186,705	.....	605	4,361	1,548
Total, five months, 1927....tons	180,664	8,916	1,236	608	2,063	12	.....	193,449	484	5,509	3,618

Compiled from statistics supplied by the Rubber Association of America, Inc.

World Rubber Production—Net Exports

Long Tons 1928

	Jan.	Feb.	Mar.	Apr.	May
British Malaya:					
Gross exports	27,731	28,813	27,813	20,029	26,403
Imports	16,618	12,911	10,508	9,335	10,350
Net	11,113	15,902	17,305	10,694	16,053
Ceylon	4,352	4,353	3,460	3,125	.....
India and Burma	1,605	1,081	775	789	.....
Sarawak	842	667	645	630	842
B. N. Borneo	*500	*500	*500	*500	*500
Siam	525	536	269	258	241
Java and Madura	4,851	4,052	3,999	3,993	.....
Sumatra East Coast	7,988	6,757	5,826	5,040	.....
Other N. E. Indies	11,360	8,635	9,690	5,538	.....
French Indo-China	720	723	613	518	619
Amazon Valley	2,273	1,612	2,750	1,014	2,062
Other America	225	199	204	.....	.....
Mexican Guayule	432	489	575	512	.....
Africa	368	588	.....	.....	.....
Total	47,154	46,094	.....	.....	.....

*Estimated.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Absorption—Net Imports

Long Tons 1928

	Jan.	Feb.	Mar.	Apr.	May
Australia	802	616	918	832	.....
Belgium	589	599	816	575	.....
Canada	2,290	2,553	2,989	1,938	.....
Czechoslovakia	376	297	398	.....	.....
Denmark	29	43	33	23	.....
Finland	78	48	78	63	.....
France	1,764	2,526	1,902	.....	.....
Germany	2,485	2,984	3,521	2,719	.....
Italy	546	655	.....	.....	.....
Japan	1,361	1,258	1,707	.....	.....
Netherlands	52	98	95	280	.....
Norway	65	67	.....	.....	.....
Russia	572	159	468	.....	.....
Spain	335	296	497	.....	.....
Sweden	80	149	184	.....	.....
United Kingdom	1,921	3,143	3,179	—2,280	.....
United States	37,120	30,926	36,970	35,686	.....
United States (Guayule)	432	489	575	512	.....
Total	50,906	46,906	.....	.....	.....

—Excess of Exports over Imports.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Barcelona Exhibition

The Barcelona Exhibition is scheduled to open April, 1929, and will be international in scope. It will be held under the auspices of the National Government, with the management in the hands of a local directorate. The permanent exhibitions buildings which have been erected—the National Palace, the Palace of Building Arts, Press buildings, etc., are located on the slope of the mountain of Montjuich, on the outskirts of the city.

CHINA WITH ITS HUGE POPULATION HAS ONLY ONE AUTOMOBILE to every 5,000 persons.

Grasselerager "A"

Grasselerager "A" is the trade designation for a new anti-oxidant for vulcanized rubber. It is an amber colored liquid of gravity 1.005 weighing 8.2 pounds per gallon, non-volatile, has no unpleasant odor; exerts practically no effect on colors and will not bloom on unvulcanized rubber. The material has distinct accelerating power equal to 0.4 that of D. P. G. Therefore, in moderately accelerated stocks it may be necessary to make adjustment for this accelerating value. For some purposes sufficient acceleration is obtained from Grasselerager "A" alone.